

Material Safety Data Sheet

1,1'-Diethyl-2,2'-Cyanine Iodide, 99% (UV-Vis)

ACC# 75953

Section 1 - Chemical Product and Company Identification

MSDS Name: 1,1'-Diethyl-2,2'-Cyanine Iodide, 99% (UV-Vis)

Catalog Numbers: AC407250000, AC407255000, EK1195692

Synonyms: None.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
977-96-8	Quinolinium,1-ethyl-2-(1-ethyl-2(1h)-quinolinylidene)methyl,	99	213-556-6

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: dark red crystals.

Caution! May cause eye and skin irritation. May cause respiratory and digestive tract irritation. Light sensitive. May cause reproductive and fetal effects. The toxicological properties of this material have not been fully investigated.

Target Organs: Thyroid.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation.

Ingestion: May cause irritation of the digestive tract. The toxicological properties of this substance have not been fully investigated. Chronic ingestion of iodides during pregnancy

has resulted in fetal death, severe goiter, and cretinoid appearance of the newborn.

Inhalation: May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated.

Chronic: Chronic ingestion of iodides during pregnancy has resulted in fetal death, severe goiter, and cretinoid appearance of the newborn. Prolonged exposure to iodides may produce iodism in sensitive individuals. Symptoms could include skin rash, running nose and headache.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid. Do NOT use mouth-to-mouth resuscitation. If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use agent most appropriate to extinguish fire. Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container.

Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation. Store protected from light.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Store protected from light.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Quinolinium,1-ethyl-2-(1-ethyl-2(1h)-quinolinylidene)methyl,	none listed	none listed	none listed

OSHA Vacated PELs: Quinolinium,1-ethyl-2-(1-ethyl-2(1h)-quinolinylidene)methyl,: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Crystals

Appearance: dark red
Odor: Not available.
pH: Not available.
Vapor Pressure: Not available.
Vapor Density: Not available.
Evaporation Rate:Not available.
Viscosity: Not available.
Boiling Point: Not available.
Freezing/Melting Point:273 deg C
Decomposition Temperature:> 273 deg C
Solubility: Not available.
Specific Gravity/Density:Not available.
Molecular Formula:C₂₃H₂₃N₂
Molecular Weight:454.34

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Incompatible materials, light, dust generation, excess heat, strong oxidants.
Incompatibilities with Other Materials: Oxidizing agents.
Hazardous Decomposition Products: Carbon monoxide, oxides of nitrogen, oxides of nitrogen, carbon dioxide, hydrogen iodide.
Hazardous Polymerization: Has not been reported

Section 11 - Toxicological Information

RTECS#:
CAS# 977-96-8 unlisted.
LD50/LC50:
Not available.

Carcinogenicity:
CAS# 977-96-8: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found
Teratogenicity: No information found
Reproductive Effects: No information found
Mutagenicity: No information found
Neurotoxicity: No information found
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	DOT regulated - small quantity provisions apply (see 49CFR173.4)	TOXIC SOLID ORGANIC NOS (DIETHYL CYANINE IODIDE)
Hazard Class:		6.1
UN Number:		UN2811
Packing Group:		II

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 977-96-8 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 977-96-8 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

T

Risk Phrases:

R 23/24/25 Toxic by inhalation, in contact with skin and if swallowed.

Safety Phrases:

S 37 Wear suitable gloves.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 28A After contact with skin, wash immediately with plenty of water

WGK (Water Danger/Protection)

CAS# 977-96-8: No information available.

Canada - DSL/NDSL

CAS# 977-96-8 is listed on Canada's DSL List.

Canada - WHMIS

not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

1,1'-Diethyl-2,2'-Dicarbocyanine Iodide, 99% (UV-Vis)

ACC# 25906

Section 1 - Chemical Product and Company Identification

MSDS Name: 1,1'-Diethyl-2,2'-Dicarbocyanine Iodide, 99% (UV-Vis)

Catalog Numbers: AC407260000, AC407265000, ACE1347145

Synonyms: None.

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
14187-31-6	Quinolinium,1-ethyl-2-5-(1-ethyl-2(1h)-quinolinylidene)-1,3p	99	238-040-8

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: green powder.

Caution! May cause eye and skin irritation. May cause respiratory and digestive tract irritation. Light sensitive. May cause reproductive and fetal effects. The toxicological properties of this material have not been fully investigated.

Target Organs: Thyroid.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation.

Ingestion: May cause irritation of the digestive tract. The toxicological properties of this substance have not been fully investigated. Chronic ingestion of iodides during pregnancy has resulted in fetal death, severe goiter, and cretinoid appearance of the newborn.

Inhalation: May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated.

Chronic: Chronic ingestion of iodides during pregnancy has resulted in fetal death, severe

goiter, and cretinoid appearance of the newborn. Prolonged exposure to iodides may produce iodism in sensitive individuals. Symptoms could include skin rash, running nose and headache.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid. Do NOT use mouth-to-mouth resuscitation. If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use agent most appropriate to extinguish fire. Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation. Store protected from light.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Store protected from light.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Quinolinium,1-ethyl-2-5-(1-ethyl-2(1h)-quinolinylidene)-1,3p	none listed	none listed	none listed

OSHA Vacated PELs: Quinolinium,1-ethyl-2-5-(1-ethyl-2(1h)-quinolinylidene)-1,3p: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Powder

Appearance: green

Odor: Not available.

pH: Not available.

Vapor Pressure: Not available.
Vapor Density: Not available.
Evaporation Rate:Not available.
Viscosity: Not available.
Boiling Point: Not available.
Freezing/Melting Point:263-265C
Decomposition Temperature:Not available.
Solubility: Not available.
Specific Gravity/Density:Not available.
Molecular Formula:C₂₇H₂₇N₂
Molecular Weight:506.42

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Incompatible materials, light, dust generation, excess heat, strong oxidants.
Incompatibilities with Other Materials: Oxidizing agents.
Hazardous Decomposition Products: Carbon monoxide, oxides of nitrogen, oxides of nitrogen, carbon dioxide, hydrogen iodide.
Hazardous Polymerization: Has not been reported

Section 11 - Toxicological Information

RTECS#:
CAS# 14187-31-6 unlisted.
LD50/LC50:
Not available.

Carcinogenicity:
CAS# 14187-31-6: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found
Teratogenicity: No information found
Reproductive Effects: No information found
Mutagenicity: No information found
Neurotoxicity: No information found
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 14187-31-6 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 14187-31-6 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

XN

Risk Phrases:

R 20/21/22 Harmful by inhalation, in contact with skin and if swallowed.

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

S 37 Wear suitable gloves.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 28A After contact with skin, wash immediately with plenty of water

WGK (Water Danger/Protection)

CAS# 14187-31-6: No information available.

Canada - DSL/NDSL

CAS# 14187-31-6 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B, D2A.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

1-Naphthol >98%

ACC# 26135

Section 1 - Chemical Product and Company Identification

MSDS Name: 1-Naphthol >98%

Catalog Numbers: AC128190000, AC128190050, AC128191000, AC415300000, AC415302500, 12819-5000, 41530-0010, B12281, N12-100

Synonyms: 1-Naphthalenol; alpha-Naphthol; 1-Hydroxynaphthalene; alpha-Hydroxynaphthalene.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
90-15-3	1-Naphthol	>98	201-969-4

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: gray or beige to brown flakes.

Warning! Causes severe eye irritation and possible eye injury. Harmful if swallowed, inhaled, or absorbed through the skin. Causes skin and respiratory tract irritation. May cause blood abnormalities. May cause liver and kidney damage.

Target Organs: Blood, kidneys, liver, eyes.

Potential Health Effects

Eye: May cause eye injury.

Skin: Causes skin irritation. Harmful if absorbed through the skin.

Ingestion: Harmful if swallowed. Causes gastrointestinal irritation with nausea, vomiting

and diarrhea. May cause burns to the digestive tract. Overexposure may result in hemolytic anemia, leading to kidney failure. Symptoms include diarrhea, headache, perspiration, listlessness and

Inhalation: Harmful if inhaled. May cause severe irritation of the upper respiratory tract with pain, burns, and inflammation.

Chronic: May cause liver and kidney damage. May cause anemia and other blood cell abnormalities. Chronic inhalation, skin absorption or ingestion of naphthalene have caused severe hemolytic anemia.

Section 4 - First Aid Measures

Eyes: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical aid immediately.

Skin: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid immediately. Wash clothing before reuse.

Ingestion: If swallowed, do NOT induce vomiting. Get medical aid immediately. If victim is fully conscious, give a cupful of water. Never give anything by mouth to an unconscious person.

Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. This material in sufficient quantity and reduced particle size is capable of creating a dust explosion.

Extinguishing Media: Use dry chemical, carbon dioxide, or appropriate foam.

Flash Point: 125 deg C (257.00 deg F)

Autoignition Temperature: 541 deg C (1,005.80 deg F)

Explosion Limits, Lower: .80 vol %

Upper: 5.00 vol %

NFPA Rating: (estimated) Health: 2; Flammability: 1; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Do not get in eyes, on skin, or on clothing. Keep container tightly closed. Do not breathe dust.

Storage: Keep container closed when not in use. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Storage under a nitrogen blanket has been recommended. Store protected from light.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
1-Naphthol	none listed	none listed	none listed

OSHA Vacated PELs: 1-Naphthol: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Flakes

Appearance: gray or beige to brown

Odor: slight phenolic odor

pH: Not available.

Vapor Pressure: 1 mm Hg @ 94 deg C
Vapor Density: 4.5 (air=1)
Evaporation Rate: Not available.
Viscosity: Not available.
Boiling Point: 278 - 280 deg C @ 760 mmHg
Freezing/Melting Point: 94 - 98 deg C
Decomposition Temperature: Not available.
Solubility: practically insoluble in water
Specific Gravity/Density: Not available.
Molecular Formula: C10H8O
Molecular Weight: 144.17

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures. Darkens on exposure to light.

Conditions to Avoid: Light, dust generation, exposure to air.

Incompatibilities with Other Materials: Strong oxidizing agents, strong bases, acid chlorides, acid anhydrides, halogens.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide, acrid smoke and fumes.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 90-15-3: QL2800000

LD50/LC50:

CAS# 90-15-3:

- Draize test, rabbit, eye: 1 mg Severe;
- Draize test, rabbit, skin: 500 mg/24H Severe;
- Inhalation, rat: LC50 = >420 mg/m³/1H;
- Oral, mouse: LD50 = 275 mg/kg;
- Oral, mouse: LD50 = 275 mg/kg;
- Oral, rabbit: LD50 = 9 gm/kg;
- Oral, rabbit: LD50 = 9000 mg/kg;
- Oral, rat: LD50 = 1870 mg/kg;
- Oral, rat: LD50 = 2000 mg/kg;
- Skin, rabbit: LD50 = 880 mg/kg;
- Skin, rabbit: LD50 = 880 mg/kg;

Carcinogenicity:

CAS# 90-15-3: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No data available.

Teratogenicity: 1-Naphthol was not teratogenic when tested in mice or rats. The rat study used doses as high as 5% in the diet, which produced mild maternal toxicity but no effects on the offspring.

Reproductive Effects: No data available.

Mutagenicity: See actual entry in RTECS for complete information.

Neurotoxicity: No data available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	TOXIC SOLIDS, ORGANIC, N.O.S.	CORROSIVE SOLID NOS (1-NAPHTHOL)
Hazard Class:	6.1	8
UN Number:	UN2811	UN1759
Packing Group:	III	II

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 90-15-3 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 90-15-3: immediate, delayed.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 90-15-3 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

XN

Risk Phrases:

R 21/22 Harmful in contact with skin and if swallowed.

R 37/38 Irritating to respiratory system and skin.

R 41 Risk of serious damage to eyes.

Safety Phrases:

S 22 Do not breathe dust.

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 37/39 Wear suitable gloves and eye/face protection.

WGK (Water Danger/Protection)

CAS# 90-15-3: 1

Canada - DSL/NDSL

CAS# 90-15-3 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D1B, D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 90-15-3 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

1-Nitroso-2-naphthol, 98%

ACC# 16094

Section 1 - Chemical Product and Company Identification

MSDS Name: 1-Nitroso-2-naphthol, 98%

Catalog Numbers: AC151530000, AC151530250, AC151531000, AC151535000

Synonyms: 1-Nitroso-2-naftol; Nitroso-beta-naphthol; alpha-Nitroso-beta-naphthol.

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
131-91-9	1-Nitroso-2-naphthol	98	205-043-0

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: brown powder.

Caution! May cause eye, skin, and respiratory tract irritation. Danger of cumulative effects. The toxicological properties of this material have not been fully investigated.

Target Organs: No data found.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation.

Ingestion: May cause irritation of the digestive tract. The toxicological properties of this substance have not been fully investigated.

Inhalation: May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Runoff from fire control or dilution water may cause pollution.

Extinguishing Media: Use agent most appropriate to extinguish fire. Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before

reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Keep container closed when not in use. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
1-Nitroso-2-naphthol	none listed	none listed	none listed

OSHA Vacated PELs: 1-Nitroso-2-naphthol: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Powder

Appearance: brown

Odor: Not available.

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 106.00 - 108.00 deg C

Decomposition Temperature: Not available.

Solubility: insoluble

Specific Gravity/Density: Not available.

Molecular Formula:C10H7NO2

Molecular Weight:173.17

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, dust generation, excess heat, strong oxidants.

Incompatibilities with Other Materials: Oxidizing agents, strong bases.

Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, irritating and toxic fumes and gases, carbon dioxide, nitrogen gas.

Hazardous Polymerization: Has not been reported

Section 11 - Toxicological Information

RTECS#:

CAS# 131-91-9: QL4725000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 131-91-9: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: Mutation in microorganisms:

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR

Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 131-91-9 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

SARA Codes

CAS # 131-91-9: immediate, delayed.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 131-91-9 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XN

Risk Phrases:

R 33 Danger of cumulative effects.

Safety Phrases:

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

WGK (Water Danger/Protection)

CAS# 131-91-9: No information available.

Canada - DSL/NDSL

CAS# 131-91-9 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

2,4-Dinitrophenol, moistened with up to 35% water

ACC# 65133

Section 1 - Chemical Product and Company Identification

MSDS Name: 2,4-Dinitrophenol, moistened with up to 35% water

Catalog Numbers: AC117040000, AC117040010, AC117040050, AC117042500

Synonyms: alpha-Dinitrophenol; Dinofan; 1-Hydroxy-2,4-dinitrobenzene; Solfo Black.

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
51-28-5	2,4-Dinitrophenol	>65	200-087-7
7732-18-5	Water	<35	231-791-2

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: yellow to brown.

Danger! Explosive when dry. Flammable solid. May be fatal if inhaled or swallowed. Harmful if absorbed through the skin. Causes eye, skin, and respiratory tract irritation. Marine pollutant.

Target Organs: Kidneys, heart, central nervous system, liver, reproductive system.

Potential Health Effects

Eye: Causes eye irritation. A worker accidentally sprayed dinitrophenol into his eye. Chemical conjunctivitis developed and it was treated with Blinex, Neosporin ophthalmic ointment, and an eye patch. His vision was impaired for one month.

Skin: Causes skin irritation. Harmful if absorbed through the skin. 2,4-Dinitrophenol causes maculopapular dermatitis. Dermatitis may be due to either primary irritation or allergic sensitivity.

Ingestion: May be fatal if swallowed. The metabolic rate of the poisoned individual can increase markedly, and the body temperature is elevated. Dinitrophenol exerts its toxic

effects by a general disturbance of cell metabolism resulting in a need to consume excessive amounts of oxygen in order to synthesize the essential adenine nucleotide required for cell survival in the brain, heart, and muscles.

Inhalation: May be fatal if inhaled. Causes respiratory tract irritation. May cause effects similar to those described for ingestion. Signs and symptoms of acute poisoning in humans include nausea, restlessness, flushed skin, sweating, rapid respiration, tachycardia, fever, cyanosis, and finally, collapse and coma. If the acute phase of poisoning is survived, the patient usually tolerates later complications, which may include renal insufficiency and toxic hepatitis.

Chronic: Prolonged or repeated skin contact may cause dermatitis. May cause liver and kidney damage. May cause reproductive and fetal effects. 2,4-Dinitrophenol signs and symptoms are fever/hyperthermia, skin discoloration, acidosis (metabolic, delayed), hypotension, cataract (subcapsular), hearing impairment

Section 4 - First Aid Measures

Eyes: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical aid.

Skin: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid immediately. Wash clothing before reuse.

Ingestion: Call a poison control center. If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: POISON material. If inhaled, get medical aid immediately. Remove victim to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. This material poses an explosion hazard when dry. Flammable solid.

Extinguishing Media: If water is the only media available, use in flooding amounts. For large fires flood fire with water from a distance.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 3; Flammability: 2; Instability: 1

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Reduce airborne dust and prevent scattering by moistening with water. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Remove all sources of ignition. Use a spark-proof tool. If the material is dry, explosives experts may be necessary to dispose of the spill. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use only in a well-ventilated area. Ground and bond containers when transferring material. Do not get in eyes, on skin, or on clothing. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Do not ingest or inhale. Store protected from light. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames.

Storage: Store in a cool place in the original container and protect from sunlight. Store in a tightly closed container. Material can ignite if dry. Do not allow material to completely dry. Keep container closed to prevent drying out.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
2,4-Dinitrophenol	none listed	none listed	none listed
Water	none listed	none listed	none listed
Dinitrophenol (mixed isomers)	none listed	none listed	none listed

OSHA Vacated PELs: 2,4-Dinitrophenol: No OSHA Vacated PELs are listed for this chemical. Water: No OSHA Vacated PELs are listed for this chemical. Dinitrophenol (mixed isomers): No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Use chemical splash and impact-rated goggles.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or

European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: yellow to brown

Odor: None reported.

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: 6.35

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 114-115 deg C

Decomposition Temperature: Not available.

Solubility: Slightly soluble.

Specific Gravity/Density: 1.683

Molecular Formula: C₆H₄N₂O₅

Molecular Weight: 184.11

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: High temperatures, light, ignition sources, dehydrating agents.

Incompatibilities with Other Materials: Strong oxidizing agents, strong bases, acid chlorides, acid anhydrides, and light. Forms explosive salts with alkalis and ammonia.

Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, carbon dioxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 51-28-5: SL2800000

CAS# 7732-18-5: ZC0110000

CAS# 25550-58-7: SL2625000

LD50/LC50:

CAS# 51-28-5:

Draize test, rabbit, skin: 300 mg/4W (Intermittent) Mild;

Oral, mouse: LD50 = 45 mg/kg;

Oral, mouse: LD50 = 72 mg/kg;

Oral, rabbit: LD50 = 30 mg/kg;
Oral, rat: LD50 = 30 mg/kg;

CAS# 7732-18-5:
Oral, rat: LD50 = >90 mL/kg;

CAS# 25550-58-7:

Lethal doses for orally ingested 2,4-dinitrophenol in humans have been reported to be 14 to 43 mg/kg.

Carcinogenicity:

CAS# 51-28-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 7732-18-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 25550-58-7: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: May cause reproductive effects.

Mutagenicity: No information available.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information available.

Physical: No information available.

Other: Dinitrophenol is used as an insecticide and as a wood preservative. All nitrophenols inhibit the microbial growth of natural aquatic systems because they uncouple the metabolic process of oxidative phosphorylation.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: CAS# 51-28-5: waste number P048.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	DINITROPHENOL, WETTED	2,4-DINITROPHENOL
Hazard Class:	4.1	4.1(6.1)
UN Number:	UN1320	UN1320
Packing Group:	I	I
Additional Info:		WETTED 15%

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 51-28-5 is listed on the TSCA inventory.

CAS# 7732-18-5 is listed on the TSCA inventory.

CAS# 25550-58-7 is not listed on the TSCA inventory. It is for research and development use only.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 51-28-5: 10 lb final RQ; 4.54 kg final RQ CAS# 25550-58-7: 10 lb final RQ; 4.54 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

SARA Codes

CAS # 51-28-5: immediate, fire.

Section 313

This material contains 2,4-Dinitrophenol (CAS# 51-28-5, >65%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR

Clean Air Act:

CAS# 51-28-5 is listed as a hazardous air pollutant (HAP).

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

CAS# 51-28-5 is listed as a Hazardous Substance under the CWA. CAS# 51-28-5 is listed as a Priority Pollutant under the Clean Water Act. CAS# 51-28-5 is listed as a Toxic Pollutant under the Clean Water Act.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 51-28-5 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Massachusetts.

CAS# 7732-18-5 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

CAS# 25550-58-7 can be found on the following state right to know lists: New Jersey, Pennsylvania, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

T F N

Risk Phrases:

R 1 Explosive when dry.

R 11 Highly flammable.

R 23/24/25 Toxic by inhalation, in contact with skin and if swallowed.

R 33 Danger of cumulative effects.

R 50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Phrases:

S 37 Wear suitable gloves.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 60 This material and its container must be disposed of as hazardous waste.

S 28A After contact with skin, wash immediately with plenty of water

S 61 Avoid release to the environment. Refer to special instructions /safety data sheets.

WGK (Water Danger/Protection)

CAS# 51-28-5: No information available.

CAS# 7732-18-5: No information available.

CAS# 25550-58-7: No information available.

Canada - DSL/NDSL

CAS# 51-28-5 is listed on Canada's DSL List.

CAS# 7732-18-5 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of B4, D1A.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 51-28-5 is listed on the Canadian Ingredient Disclosure List.

CAS# 25550-58-7 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

2,4-Dinitrofluorobenzene

ACC# 91831

Section 1 - Chemical Product and Company Identification

MSDS Name: 2,4-Dinitrofluorobenzene

Catalog Numbers: AC117030000, AC117030050, AC117030250, AC117031000

Synonyms: 1-Fluoro-2,4-dinitrobenzene; Sanger's reagent; FDNB; DNFB.

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
70-34-8	2,4-Dinitrofluorobenzene	98	200-734-3

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: yellow solid or liquid.

Danger! May be fatal if absorbed through the skin or swallowed. Vesicant (agent that induces blistering). Causes eye and skin irritation and possible burns. Causes digestive and respiratory tract irritation with possible burns. May cause allergic respiratory and skin reaction.

Target Organs: Central nervous system, respiratory system, eyes, skin.

Potential Health Effects

Eye: Causes eye irritation and possible burns.

Skin: Causes severe skin irritation. May be fatal if absorbed through the skin. May cause skin sensitization, an allergic reaction, which becomes evident upon re-exposure to this material. This material is a vesicant, that is, it will induce blistering.

Ingestion: May be fatal if swallowed. May cause severe gastrointestinal tract irritation with nausea, vomiting and possible burns. May cause central nervous system effects. Ingestion of large amounts of fluoride may cause salivation, nausea, vomiting, abdominal pain, fever, labored breathing. Exposure to fluoride compounds can result in systemic toxic effects on

the heart, liver, and kidneys. It may also deplete calcium levels in the body leading to hypocalcemia and death. Acute oral toxicity tests have shown lethality with central nervous system signs in mice.

Inhalation: May cause allergic respiratory reaction. May cause severe irritation of the respiratory tract with possible burns.

Chronic: Chronic inhalation and ingestion may cause chronic fluoride poisoning (fluorosis) characterized by weight loss, weakness, anemia, brittle bones, and stiff joints. Repeated exposure may cause central nervous system damage. Chronic exposure to fluoride compounds may cause systemic toxicity.

Section 4 - First Aid Measures

Eyes: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical aid immediately.

Skin: POISON material. In case of contact, get medical aid immediately. Immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Destroy contaminated shoes.

Ingestion: POISON material. If swallowed, get medical aid immediately. Only induce vomiting if directed to do so by medical personnel. Never give anything by mouth to an unconscious person.

Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Violently decomposes when heated under confinement.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: > 112 deg C (> 233.60 deg F)

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 3; Flammability: 1; Instability:

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Clean up spills immediately, observing precautions in the Protective

Equipment section. Sweep up or absorb material, then place into a suitable clean, dry, closed container for disposal. Provide ventilation. Evacuate unnecessary personnel. Keep unnecessary and unprotected personnel away.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Do not breathe dust, mist, or vapor. Do not get in eyes, on skin, or on clothing. Use only with adequate ventilation.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
2,4-Dinitrofluorobenzene	none listed	none listed	none listed

OSHA Vacated PELs: 2,4-Dinitrofluorobenzene: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear chemical splash goggles.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid or liquid

Appearance: yellow

Odor: acrid odor

pH: Not available.

Vapor Pressure: 0.00135 mm Hg @ 25 deg C

Vapor Density: Not available.
Evaporation Rate:Not available.
Viscosity: Not available.
Boiling Point: 296 deg C
Freezing/Melting Point:23-26 deg C
Decomposition Temperature:Not available.
Solubility: insoluble
Specific Gravity/Density:1.480 g/cm³
Molecular Formula:C₆H₃FN₂O₄
Molecular Weight:186.10

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Excess heat, Solution in ether may explode when evaporated., confined spaces.
Incompatibilities with Other Materials: Strong oxidizing agents, strong bases.
Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, carbon dioxide, hydrogen fluoride gas.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 70-34-8: CZ7800000
LD50/LC50:
Not available.
Rat LDLo Oral: 50 mg/kg (RTECS)., Mouse LDLo Skin: 100 mg/kg (RTECS)., Mouse LD50 Oral: 25-50 mg/kg lethality with CNS signs (Eastman Kodak)
Carcinogenicity:
CAS# 70-34-8: Not listed by ACGIH, IARC, NTP, or CA Prop 65.
Epidemiology: No data available.
Teratogenicity: No data available.
Reproductive Effects: No data available.
Mutagenicity: No data available.
Neurotoxicity: No data available.
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	TOXIC SOLIDS, ORGANIC, N.O.S.	TOXIC SOLID ORGANIC NOS (FLUORODINITROBENZENE)
Hazard Class:	6.1	6.1
UN Number:	UN2811	UN2811
Packing Group:	II	II

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 70-34-8 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 70-34-8: immediate.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 70-34-8 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

T

Risk Phrases:

R 23/24/25 Toxic by inhalation, in contact with skin and if swallowed.

R 33 Danger of cumulative effects.

R 42/43 May cause sensitization by inhalation and skin contact.

R 44 Risk of explosion if heated under confinement.

Safety Phrases:

S 37 Wear suitable gloves.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 28A After contact with skin, wash immediately with plenty of water

WGK (Water Danger/Protection)

CAS# 70-34-8: No information available.

Canada - DSL/NDSL

CAS# 70-34-8 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D1A, D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

4-Hydroxybenzoic acid, 99%

ACC# 96167

Section 1 - Chemical Product and Company Identification

MSDS Name: 4-Hydroxybenzoic acid, 99%

Catalog Numbers: AC120990000, AC120995000, 12099-0010, 12099-1000

Synonyms: 4-Carboxyphenol; p-Hydroxybenzoic acid; p-Salicylic acid

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
99-96-7	4-Hydroxybenzoic acid, 99%	99.0	202-804-9

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white to off-white crystalline powder.

Caution! May cause severe eye irritation and possible injury. May cause skin irritation. May cause respiratory and digestive tract irritation. Ingestion of high doses may cause systemic effects.

Target Organs: None.

Potential Health Effects

Eye: May cause severe eye irritation. May result in corneal injury.

Skin: May cause skin irritation.

Ingestion: May cause irritation of the digestive tract. Ingestion of large amounts may cause systemic effects such as nausea, stomach pain, rapid breathing, sweating, convulsions, coma, cardiovascular collapse and possible death.

Inhalation: Dust is irritating to the respiratory tract. May cause effects similar to those described for ingestion.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Get medical aid if irritation develops or persists. Flush skin with plenty of soap and water.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Get medical aid immediately.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: In case of fire, use water, dry chemical, chemical foam, or alcohol-resistant foam.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up, then place into a suitable container for disposal.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation.

Storage: Store in a cool, dry place. Keep container closed when not in use.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use process enclosure, local exhaust ventilation, or other engineering controls to control airborne levels.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
4-Hydroxybenzoic acid, 99%	none listed	none listed	none listed

OSHA Vacated PELs: 4-Hydroxybenzoic acid, 99%: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves and clothing to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Crystalline powder

Appearance: white to off-white

Odor: None reported.

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: @ 760.00mm Hg

Freezing/Melting Point: 215.00 - 217.00 deg C

Decomposition Temperature: Not available.

Solubility: Slightly soluble.

Specific Gravity/Density: Not available.

Molecular Formula: C₇H₆O₃

Molecular Weight: 138.12

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, strong oxidants.

Incompatibilities with Other Materials: Strong oxidizing agents.

Hazardous Decomposition Products: Carbon monoxide, carbon monoxide, carbon dioxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 99-96-7: DH1925000

LD50/LC50:

CAS# 99-96-7:

Oral, mouse: LD50 = 2200 mg/kg;

Oral, rat: LD50 = >10 gm/kg;

Carcinogenicity:

CAS# 99-96-7: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: No information available.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 99-96-7 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 99-96-7: fire.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 99-96-7 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 99-96-7: 1

Canada - DSL/NDSL

CAS# 99-96-7 is listed on Canada's DSL List.

Canada - WHMIS

WHMIS: Not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Acetamide

ACC# 00110

Section 1 - Chemical Product and Company Identification

MSDS Name: Acetamide

Catalog Numbers: AC102240000, AC102241000, AC102245000, AC153630000, AC153630050, AC153631000, AC153635000, S70042, S70045, S75020, S75021, A4-250, A4-500

Synonyms: Acetic acid amide; Ethanamide; Methanecarboxamide.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
60-35-5	Acetamide	>99	200-473-5

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white crystals.

Warning! Possible cancer hazard. May cause cancer based on animal data. Hygroscopic (absorbs moisture from the air).

Target Organs: Kidneys, liver.

Potential Health Effects

Eye: May cause eye irritation.

Skin: Causes mild skin irritation. May be harmful if absorbed through the skin.

Ingestion: Ingestion of large amounts may cause gastrointestinal irritation. May be harmful if swallowed.

Inhalation: May cause respiratory tract irritation. May be harmful if inhaled.

Chronic: May cause kidney injury. May cause cancer according to animal studies. Limited evidence of a carcinogenic effect.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: Do not induce vomiting. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media: Water or foam may cause frothing. Use dry chemical or carbon dioxide.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 1; Instability: 1

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation. Do not let this chemical enter the environment.

Section 7 - Handling and Storage

Handling: Minimize dust generation and accumulation. Avoid contact with eyes, skin, and

clothing. Avoid ingestion and inhalation. Use with adequate ventilation.

Storage: Store in a cool, dry place. Store in a tightly closed container.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Acetamide	none listed	none listed	none listed

OSHA Vacated PELs: Acetamide: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Crystals

Appearance: white

Odor: characteristic odor

pH: Not available.

Vapor Pressure: 1.33 hPa @ 65 deg C

Vapor Density: ~2

Evaporation Rate: Negligible.

Viscosity: Not available.

Boiling Point: 221 deg C

Freezing/Melting Point: 79 - 81 deg C

Decomposition Temperature: Not available.

Solubility: 2000 g/L (20°C)

Specific Gravity/Density: 1.16

Molecular Formula: C₂H₅NO

Molecular Weight: 59.06

Section 10 - Stability and Reactivity

Chemical Stability: Hygroscopic: absorbs moisture or water from the air.

Conditions to Avoid: Incompatible materials, dust generation, excess heat, exposure to moist air or water.

Incompatibilities with Other Materials: Metals, strong oxidizing agents, strong reducing agents, strong acids, strong bases, halogenated agents.

Hazardous Decomposition Products: Carbon monoxide, oxides of nitrogen, carbon dioxide, ammonia.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 60-35-5: AB4025000

LD50/LC50:

CAS# 60-35-5:

Oral, mouse: LD50 = 12900 mg/kg;

Oral, rat: LD50 = 7 gm/kg;

Carcinogenicity:

CAS# 60-35-5:

- **ACGIH:** Not listed.
- **California:** carcinogen, initial date 1/1/90
- **NTP:** Not listed.
- **IARC:** Group 2B carcinogen

Epidemiology: IARC Group 2B: Proven animal carcinogenic substance of potential relevance to humans.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: No information available.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: Terrestrial: Very high leachability due to its solubility. Aquatic: Readily

biodegrades. Atmospheric: Exists as an aerosol and is removed by wet deposition. Not expected to bioconcentrate.

Physical: No information available.

Other: For more information, see "HANDBOOK OF ENVIRONMENTAL FATE AND EXPOSURE DATA."

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated.	Not regulated.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 60-35-5 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 60-35-5: 100 lb final RQ; 45.4 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 60-35-5: delayed.

Section 313

This material contains Acetamide (CAS# 60-35-5, >99%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

CAS# 60-35-5 is listed as a hazardous air pollutant (HAP).

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 60-35-5 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

California Prop 65

The following statement(s) is(are) made in order to comply with the California Safe Drinking Water Act:

WARNING: This product contains Acetamide, a chemical known to the state of California to cause cancer.

California No Significant Risk Level: CAS# 60-35-5: 10 æg/day NSRL

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XN

Risk Phrases:

R 40 Limited evidence of a carcinogenic effect.

Safety Phrases:

S 36/37 Wear suitable protective clothing and gloves.

WGK (Water Danger/Protection)

CAS# 60-35-5: 1

Canada - DSL/NDSL

CAS# 60-35-5 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2A.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Acetanilide

ACC# 00115

Section 1 - Chemical Product and Company Identification

MSDS Name: Acetanilide

Catalog Numbers: AC150810000, AC150810050, AC150810051, AC400050250, AC400051000, 15081-0010, 15081-2500, 15081-5000, O1013-250

Synonyms: N-Phenylacetamide

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
103-84-4	Acetanilide	100	203-150-7

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white glistening crystals. solid.

Warning! May cause eye, skin, and respiratory tract irritation. May cause allergic skin reaction. May be harmful if swallowed. May cause blood abnormalities. May cause central nervous system effects.

Target Organs: Blood, kidneys, central nervous system, skin.

Potential Health Effects

Eye: Dust may cause mechanical irritation.

Skin: May cause skin irritation. May cause skin sensitization, an allergic reaction, which becomes evident upon re-exposure to this material.

Ingestion: Harmful if swallowed. May cause irritation of the digestive tract. May cause

kidney damage. May cause methemoglobinemia, cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood), convulsions, and death. Human systemic effects by ingestion may include: visual field changes, tinnitus, and nausea or vomiting. May cause hallucinations and distorted perceptions. Ingestion may cause kidney damage including acute tubular necrosis and acute renal failure.

Inhalation: May cause respiratory tract irritation. May cause methemoglobinemia, cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood), convulsions, tachycardia, dyspnea (labored breathing), and death. May cause effects similar to those described for ingestion. Coal tar analgetics including acetanilide are depressants of the central nervous system.

Chronic: Chronic exposure may cause effects similar to those of acute exposure.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Call a poison control center. If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Get medical aid immediately. Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Will burn if involved in a fire. Dust can be an explosion hazard when exposed to heat or flame. Vapors may be heavier than air. They can spread along the ground and collect in low or confined areas.

Extinguishing Media: For small fires, use water spray, dry chemical, carbon dioxide or chemical foam. Use water spray to cool fire-exposed containers.

Flash Point: 173 deg C (343.40 deg F)

Autoignition Temperature: 545 deg C (1,013.00 deg F)

Explosion Limits, Lower:Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 1; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation.

Storage: Keep away from heat and flame. Store in a tightly closed container. Keep from contact with oxidizing materials. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from strong bases.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local explosion-proof ventilation to keep airborne levels to acceptable levels.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Acetanilide	none listed	none listed	none listed

OSHA Vacated PELs: Acetanilide: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid
Appearance: white glistening crystals.
Odor: Not available.
pH: Not available.
Vapor Pressure: 1 mm Hg @237 deg F
Vapor Density: 4.65 (air=1)
Evaporation Rate:Negligible.
Viscosity: Not available.
Boiling Point: 304 deg C @ 760 mmHg
Freezing/Melting Point:113 - 115 deg C
Decomposition Temperature:Not available.
Solubility: Slightly soluble.
Specific Gravity/Density:1.21
Molecular Formula:C₈H₉NO
Molecular Weight:135.17

Section 10 - Stability and Reactivity

Chemical Stability: Stable.
Conditions to Avoid: Dust generation.
Incompatibilities with Other Materials: Strong oxidizing agents, strong bases.
Hazardous Decomposition Products: Carbon monoxide, oxides of nitrogen, carbon dioxide.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 103-84-4: AD7350000
LD50/LC50:
CAS# 103-84-4:
Oral, mouse: LD50 = 1210 mg/kg;
Oral, rat: LD50 = 800 mg/kg;

Carcinogenicity:
CAS# 103-84-4: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found
Teratogenicity: No information found
Reproductive Effects: No information found
Mutagenicity: Micronucleus test(Intraperitoneal,mouse) = 50 mg/kg
Neurotoxicity: No information found
Other Studies:

Section 12 - Ecological Information

Ecotoxicity: Fish: Bluegill/Sunfish: LC50 = 100 mg/L; 96 Hr.; Static, 23 degrees C No data available.

Environmental: An estimated BCF value of 4.5 was calculated for acetanilide, using an experimental log Kow of 1.16. According to a classification scheme, this BCF value suggests that bioconcentration in aquatic organisms is low.

Physical: Acetanilide is not expected to undergo hydrolysis or direct photolysis in the environment due to the lack of functional groups to hydrolyze or absorb UV light.

Other: No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 103-84-4 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 103-84-4: immediate, delayed.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 103-84-4 can be found on the following state right to know lists: Pennsylvania, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XN

Risk Phrases:

R 22 Harmful if swallowed.

Safety Phrases:

WGK (Water Danger/Protection)

CAS# 103-84-4: 1

Canada - DSL/NDSL

CAS# 103-84-4 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Fuchsin Acid

ACC# 10082

Section 1 - Chemical Product and Company Identification

MSDS Name: Fuchsin Acid

Catalog Numbers: F97-25

Synonyms: Acid fuchsine; Acid magenta; Fushine acid; CI 42685; Acid violet 19.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
3244-88-0	Fuchsin Acid	100	221-816-5

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: green solid.

Caution! May cause eye, skin, and respiratory tract irritation. The toxicological properties of this material have not been fully investigated.

Target Organs: None.

Potential Health Effects

Eye: May cause eye irritation. The toxicological properties of this material have not been fully investigated.

Skin: May cause skin irritation. The toxicological properties of this material have not been fully investigated.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. The toxicological properties of this substance have not been fully investigated.

Inhalation: May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists. Wash clothing before reuse.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Vapors may be heavier than air. They can spread along the ground and collect in low or confined areas.

Extinguishing Media: Use water spray, dry chemical, or carbon dioxide. Use agent most appropriate to extinguish fire.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up, then place into a suitable container for disposal. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation.

Storage: Store in a cool, dry, well-ventilated area away from incompatible substances. Keep containers tightly closed.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Fuchsin Acid	none listed	none listed	none listed

OSHA Vacated PELs: Fuchsin Acid: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: green

Odor: none reported

pH: Acidic.

Vapor Pressure: Negligible.

Vapor Density: 20.2

Evaporation Rate: Negligible.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: Not available.

Decomposition Temperature:Not available.

Solubility: 14% in water.

Specific Gravity/Density:Not available.

Molecular Formula:C₂₀H₁₇N₃O₉S₃Na₂

Molecular Weight:585.2933

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, dust generation, excess heat.

Incompatibilities with Other Materials: Strong oxidizing agents.

Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, oxides of sulfur, carbon dioxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 3244-88-0: DD4737000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 3244-88-0: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: No information available.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information reported.

Physical: No information available.

Other: None.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 3244-88-0 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 3244-88-0 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

Not available.

Risk Phrases:**Safety Phrases:****WGK (Water Danger/Protection)**

CAS# 3244-88-0: No information available.

Canada - DSL/NDSL

CAS# 3244-88-0 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of Not controlled..

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Acridine Orange, 55%

ACC# 97431

Section 1 - Chemical Product and Company Identification

MSDS Name: Acridine Orange, 55%

Catalog Numbers: AC300910000, AC300910250, AC300911000

Synonyms: 3,6-Acridinediamine.

Company Identification:

Acros Organics N.V.

One Reagent Lane

Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
10127-02-3	Acridine Orange	55	233-353-6

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: orange solid.

Warning! Causes eye, skin, and respiratory tract irritation. Harmful if swallowed, inhaled, or absorbed through the skin. Hygroscopic (absorbs moisture from the air).

Target Organs: Respiratory system, eyes, skin.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Causes skin irritation. Harmful if absorbed through the skin.

Ingestion: Harmful if swallowed. May cause gastrointestinal irritation with nausea, vomiting and diarrhea.

Inhalation: Harmful if inhaled. Causes respiratory tract irritation.

Chronic: Prolonged or repeated skin contact may cause dermatitis.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 1; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container.

Clean up spills immediately, observing precautions in the Protective Equipment section.

Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation. Use with adequate ventilation. Wash clothing before reuse.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Store protected from moisture.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Acridine Orange	none listed	none listed	none listed

OSHA Vacated PELs: Acridine Orange: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: orange

Odor: none reported

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not applicable.

Viscosity: Not applicable.

Boiling Point: Not applicable.

Freezing/Melting Point: Not available.

Decomposition Temperature: Not available.

Solubility: Soluble.

Specific Gravity/Density: Not available.

Molecular Formula: C₁₇H₂₀N₃Cl_{1.5}ZnCl₂

Molecular Weight: 369.94

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions.

Conditions to Avoid: Dust generation, excess heat, exposure to moist air or water.

Incompatibilities with Other Materials: Strong oxidizing agents.

Hazardous Decomposition Products: Hydrogen chloride, nitrogen oxides, carbon monoxide, carbon dioxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 10127-02-3 unlisted.

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 10127-02-3: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	DYES, SOLID, TOXIC, N.O.S.	No information available.
Hazard Class:	6.1	
UN Number:	UN3143	
Packing Group:	III	

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 10127-02-3 is not listed on the TSCA inventory. It is for research and development use only.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313

This material contains Acridine Orange (listed as Zinc compounds), 55%, (CAS# 10127-02-3) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA. CAS# 10127-02-3 is listed as a Toxic Pollutant under the Clean Water Act.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 10127-02-3 can be found on the following state right to know lists: California, (listed as Zinc compounds), New Jersey, (listed as Zinc compounds), Pennsylvania, (listed as Zinc compounds).

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations European Labeling in Accordance with EC Directives

Hazard Symbols:

XN

Risk Phrases:

R 20/21/22 Harmful by inhalation, in contact with skin and if swallowed.

R 40 Limited evidence of a carcinogenic effect.

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 37 Wear suitable gloves.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 28A After contact with skin, wash immediately with plenty of water

WGK (Water Danger/Protection)

CAS# 10127-02-3: No information available.

Canada - DSL/NDSL

None of the chemicals in this product are listed on the DSL or NDSL list.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 10127-02-3 is not listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Albumin, egg (powder)

ACC# 00093

Section 1 - Chemical Product and Company Identification

MSDS Name: Albumin, egg (powder)

Catalog Numbers: AC400450000, AC400450500, 40045-1000, 40045-5000

Synonyms: Egg albumin; Egg white.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
9006-59-1	Albumin egg	100	232-692-7

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: fine powder.

Caution! May cause eye, skin, and respiratory tract irritation. Heat sensitive. The toxicological properties of this material have not been fully investigated.

Target Organs: None.

Potential Health Effects

Eye: Dust may cause mechanical irritation.

Skin: May cause skin irritation. May be harmful if absorbed through the skin.

Ingestion: Ingestion of large amounts may cause gastrointestinal irritation. May be harmful if swallowed.

Inhalation: May cause respiratory tract irritation. May be harmful if inhaled.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Treat symptomatically and supportively. Get medical aid immediately.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion

and inhalation.

Storage: Store in a cool, dry place. Store in a tightly closed container.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Albumin egg	none listed	none listed	none listed

OSHA Vacated PELs: Albumin egg: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Powder

Appearance: yellow-white - fine

Odor: Not available.

pH: 6 - 8

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: 61 deg C @ 760 mm Hg

Freezing/Melting Point: 0 deg C

Decomposition Temperature: 60 deg C

Solubility: Soluble.

Specific Gravity/Density: Not available.

Molecular Formula: Not available.

Molecular Weight: Not available.

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: High temperatures, incompatible materials, dust generation.

Incompatibilities with Other Materials: Strong oxidizers.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 9006-59-1: AY9384000

LD50/LC50:

CAS# 9006-59-1:

Oral, mouse: LD50 = >24 gm/kg;

Carcinogenicity:

CAS# 9006-59-1: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information reported.

Physical: No information available.

Other: None.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR

Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not Regulated	Not Regulated
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 9006-59-1 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 9006-59-1 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 9006-59-1: No information available.

Canada - DSL/NDSL

CAS# 9006-59-1 is listed on Canada's DSL List.

Canada - WHMIS

not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Alcian Blue 8GX

ACC# 96162

Section 1 - Chemical Product and Company Identification

MSDS Name: Alcian Blue 8GX

Catalog Numbers: AC190270000, AC190270250

Synonyms: Ingrain Blue; Copper(4+),n,n',n'',n'''-29h,31h-phthalocyaninetetrayl tetra.

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
33864-99-2	Alcian Blue 8GX	>98	251-705-7

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: purple-blue powder.

Caution! May cause eye and skin irritation. May cause respiratory and digestive tract irritation. The toxicological properties of this material have not been fully investigated.

Target Organs: No data found.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation. May be harmful if absorbed through the skin. Repeated or prolonged exposure may cause drying and cracking of the skin.

Ingestion: May cause irritation of the digestive tract. May be harmful if swallowed.

Inhalation: May cause respiratory tract irritation. May be harmful if inhaled.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Use water spray to keep fire-exposed containers cool.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up or absorb material, then place into a suitable clean, dry, closed container for disposal. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Store in a tightly closed container. Keep from contact with oxidizing materials. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Alcian Blue 8GX	none listed	1 mg/m ³ TWA (dust and mist, as Cu, except copper fume) (listed under Copper compounds, n.o.s.).100 mg/m ³ IDLH (dust and mist, as Cu) (listed under Copper compounds, n.o.s.).	none listed

OSHA Vacated PELs: Alcian Blue 8GX: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Powder
Appearance: purple-blue
Odor: none reported
pH: Not available.
Vapor Pressure: Negligible.
Vapor Density: Not available.
Evaporation Rate: Negligible.
Viscosity: Not available.
Boiling Point: Not available.
Freezing/Melting Point: 148 deg C
Decomposition Temperature: Not available.
Solubility: moderately soluble
Specific Gravity/Density: Not available.
Molecular Formula: C₅₆H₆₈Cl₄CuN₁₆S₄
Molecular Weight: 1298.88

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Incompatible materials, dust generation, excess heat.
Incompatibilities with Other Materials: Strong oxidizing agents.
Hazardous Decomposition Products: Hydrogen chloride, carbon monoxide, oxides of nitrogen, oxides of sulfur, carbon dioxide.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 33864-99-2 unlisted.
LD50/LC50:
Not available.

Carcinogenicity:
CAS# 33864-99-2: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found
Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not Regulated.	Not Regulated.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 33864-99-2 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313

This material contains Alcian Blue 8GX (listed as Copper compounds, n.o.s.), >98%, (CAS# 33864-99-2) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA. CAS# 33864-99-2 is listed as a Toxic Pollutant under the Clean Water Act.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 33864-99-2 can be found on the following state right to know lists: California, (listed as Copper compounds, n.o.s.), New Jersey, (listed as Copper compounds, n.o.s.), Pennsylvania, (listed as Copper compounds, n.o.s.).

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

Not available.

Risk Phrases:**Safety Phrases:**

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 33864-99-2: No information available.

Canada - DSL/NDSL

CAS# 33864-99-2 is listed on Canada's DSL List.

Canada - WHMIS

not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 33864-99-2 (listed as Copper compounds, n.o.s.) is listed on the Canadian Ingredient Disclosure List.

Section 16 - Additional Information

Material Safety Data Sheet

Alizarin, 97%

ACC# 44579

Section 1 - Chemical Product and Company Identification

MSDS Name: Alizarin, 97%

Catalog Numbers: AC153690000, AC153690250, AC153691000, AC153695000

Synonyms: 1,2-Dihydroxy-9,10-Anthraquinone; 1,2-Dihydroxyanthrquinone; CI 58000.

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
72-48-0	Alizarin	97	200-782-5

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: orange solid.

Caution! May cause respiratory and digestive tract irritation. May cause eye and skin irritation. Prolonged or repeated contact causes defatting of the skin with irritation, dryness, and cracking.

Target Organs: No data found.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation. Prolonged and/or repeated contact may cause irritation and/or dermatitis.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea.

Inhalation: May cause respiratory tract irritation.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: In case of fire, use water, dry chemical, chemical foam, or alcohol-resistant foam. Use agent most appropriate to extinguish fire.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container.

Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with skin and eyes. Avoid ingestion and inhalation.

Storage: Keep container closed when not in use. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Alizarin	none listed	none listed	none listed

OSHA Vacated PELs: Alizarin: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: orange
Odor: Not available.
pH: Not available.
Vapor Pressure: Not available.
Vapor Density: Not available.
Evaporation Rate:Not available.
Viscosity: Not available.
Boiling Point: 430 deg C
Freezing/Melting Point:290 deg C
Decomposition Temperature:Not available.
Solubility: Slightly soluble in
Specific Gravity/Density:Not available.
Molecular Formula:C14H8O4
Molecular Weight:240.0536

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Incompatible materials, dust generation, excess heat.
Incompatibilities with Other Materials: Strong oxidizing agents and bases.
Hazardous Decomposition Products: Carbon monoxide, carbon monoxide, carbon dioxide.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 72-48-0: CB6580000
LD50/LC50:
CAS# 72-48-0:
Draize test, rabbit, eye: 500 mg/24H Mild;

Carcinogenicity:
CAS# 72-48-0: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: Mutation data has been reported.
Teratogenicity: No information found
Reproductive Effects: No information found
Mutagenicity: Mutagenic effects have occurred in experimental animals.
Neurotoxicity: No information found
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 72-48-0 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 72-48-0: fire.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 72-48-0 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

Not available.

Risk Phrases:**Safety Phrases:****WGK (Water Danger/Protection)**

CAS# 72-48-0: No information available.

Canada - DSL/NDSL

CAS# 72-48-0 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 72-48-0 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Alizarin Yellow GG

ACC# 83808

Section 1 - Chemical Product and Company Identification

MSDS Name: Alizarin Yellow GG

Catalog Numbers: AC195690000, AC195690250

Synonyms: C.I. 14025; Mordant Yellow 1, 5-(M-Nitrophenylazo)salicylic Acid, Sodium Salt.

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
584-42-9	Alizarin Yellow GG	ca 100	209-536-1

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: slightly brown powder.

Caution! May cause eye and skin irritation. May cause respiratory and digestive tract irritation. The toxicological properties of this material have not been fully investigated.

Target Organs: No data found.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation.

Ingestion: May cause irritation of the digestive tract. The toxicological properties of this substance have not been fully investigated.

Inhalation: May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use agent most appropriate to extinguish fire. Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Clean up spills immediately, observing precautions in the Protective

Equipment section. Sweep up, then place into a suitable container for disposal. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Alizarin Yellow GG	none listed	none listed	none listed

OSHA Vacated PELs: Alizarin Yellow GG: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Powder
Appearance: slightly brown
Odor: None reported.
pH: Not available.
Vapor Pressure: Not available.
Vapor Density: Not available.
Evaporation Rate:Not available.
Viscosity: Not available.
Boiling Point: Not available.
Freezing/Melting Point:Not available.
Decomposition Temperature:Not available.
Solubility: soluble in cold water
Specific Gravity/Density:Not available.
Molecular Formula:C₁₃H₈N₃O₅Na
Molecular Weight:309.20

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Incompatible materials, dust generation, excess heat, strong oxidants.
Incompatibilities with Other Materials: Strong oxidizing agents.
Hazardous Decomposition Products: Carbon monoxide, oxides of nitrogen, oxides of nitrogen, carbon dioxide.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 584-42-9: DH2528550
LD50/LC50:
Not available.

Carcinogenicity:
CAS# 584-42-9: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found
Teratogenicity: No information found
Reproductive Effects: No information found
Mutagenicity: Mutagenic effects have occurred in experimental animals.

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Please contact Fisher Scientific for shipping information	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 584-42-9 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 584-42-9 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

Not available.

Risk Phrases:**Safety Phrases:**

S 24/25 Avoid contact with skin and eyes.

S 37 Wear suitable gloves.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 28A After contact with skin, wash immediately with plenty of water

WGK (Water Danger/Protection)

CAS# 584-42-9: No information available.

Canada - DSL/NDSL

CAS# 584-42-9 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2A.
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Alizarin Yellow R Indicator

ACC# 76898

Section 1 - Chemical Product and Company Identification

MSDS Name: Alizarin Yellow R Indicator

Catalog Numbers: S71374, S71910, S93109

Synonyms: Alizarin Yellow R Sodium Salt; 5-(P-Nitrophenylazo) Salicylic Acid Sodium Salt; Sodium P-Nitrobenzeneazosalicylate.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
1718-34-9	Alizarin Yellow R Sodium Salt	100.0	217-002-4

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: brown yellow, red brown or brown solid.

Caution! May cause eye and skin irritation. May cause respiratory and digestive tract irritation.

Target Organs: No data found.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. The toxicological properties of this substance have not been fully investigated.

Inhalation: May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: For small fires, use dry chemical, carbon dioxide, water spray or alcohol-resistant foam. For large fires, use dry chemical, carbon dioxide, alcohol-resistant foam, or water spray.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Do not get in eyes, on skin, or on clothing. Do not ingest or inhale.

Storage: Store in a cool, dry place. Store in a tightly closed container.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Alizarian Yellow R Sodium Salt	none listed	none listed	none listed

OSHA Vacated PELs: Alizarian Yellow R Sodium Salt: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid
Appearance: brown yellow, red brown or brown
Odor: Odorless
pH: Not available.
Vapor Pressure: Negligible
Vapor Density: 10.7
Evaporation Rate: Negligible
Viscosity: Not available.
Boiling Point: Decomposes
Freezing/Melting Point: 250 deg C
Decomposition Temperature: Not available.
Solubility: Soluble in water
Specific Gravity/Density: >1.0
Molecular Formula: $4\text{NO}_2\text{C}_6\text{H}_4\text{N}_2\text{C}_6\text{H}_3\text{C}_3\text{Na}_1\text{2O}_3\text{H}_3$
Molecular Weight: 635.1811

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Incompatible materials, dust generation, excess heat.
Incompatibilities with Other Materials: Strong oxidizing agents
Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, irritating and toxic fumes and gases, carbon dioxide.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 1718-34-9: DH2528600
LD50/LC50:
Not available.

Carcinogenicity:
CAS# 1718-34-9: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found
Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 1718-34-9 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 1718-34-9: reactive.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 1718-34-9 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

Not available.

Risk Phrases:**Safety Phrases:****WGK (Water Danger/Protection)**

CAS# 1718-34-9: No information available.

Canada - DSL/NDSL

CAS# 1718-34-9 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of Not controlled..

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those

regulations.

Canadian Ingredient Disclosure List

FISHER SCIENTIFIC -- ALUMINA(ACTIVATED/ADSORPTION/DRY POWDER/ACID/BASIC/NEUTRAL/P --
6850-00-130-2683

=====
Product Identification
=====

Product ID:ALUMINA(ACTIVATED/ADSORPTION/DRY POWDER/ACID/BASIC/NEUTRAL/P
MSDS Date:02/09/1997
FSC:6850
NIIN:00-130-2683
MSDS Number: CJVCZ
=== Responsible Party ===
Company Name:FISHER SCIENTIFIC
Address:ONE REAGENT LANE
City:FAIRLAWN
State:NJ
ZIP:07410
Country:US
Info Phone Num:800-766-7000; 201-796-7100
Emergency Phone Num:201-796-7100
Chemtrec Ind/Phone:(800)424-9300
CAGE:1B464

=== Contractor Identification ===

Company Name:AMERICO INDUSTRIAL SUPPLY INC
Address:1070 E DOMINGUEZ ST UNIT B
Box:City:CARSON
State:CA
ZIP:90746-3619
Country:US
Phone:310-763-5500 FAX:310-763-5858
Contract Num:SP0450-00-M-D180
CAGE:0XDR8
Company Name:FISHER SCIENTIFIC CO. CHEMICAL MFG DIV
Address:1 REAGENT LANE
Box:City:FAIRLAWN
State:NJ
ZIP:07410-2802
Country:US
Phone:201-796-7100
CAGE:1B464

=====
Composition/Information on Ingredients
=====

Ingred Name:ALUMINUM OXIDE
CAS:1344-28-1
RTECS #:BD1200000
= Wt:100.
OSHA PEL:15 MG/M3
ACGIH TLV:10 MG/M3

=====
Hazards Identification
=====

LD50 LC50 Mixture:NONE SPECIFIED BY MANUFACTURER.
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:EYES:DUST MAY CAUSE MECHANICAL
IRRITATION. SKIN: DUST MAY CAUSE MECHANICAL IRRITATION. LOW HAZARD
FOR USUAL INDUSTRIAL HANDLING. INGESTED: INGESTION OF LARGE AMOUNTS

MAY CAUSE GASTROINTESTINAL IRRITATION. EXPECTED TO BE A LOW INGESTION HAZARD. INHALATION: MAY CAUSE RESPIRATORY TRACT IRRITATION. MAY CAUSE LUNG DAMAGE. CHRONIC: CHRONIC INHALATION OF FINE DUSTS MAY CAUSE LUNG DAMAGE.

Explanation of Carcinogenicity: NOT CLASSIFIABLE AS A HUMAN CARCINOGEN.

Effects of Overexposure: EYE: DUST MAY CAUSE MECHANICAL IRRITATION.

SKIN: DUST MAY CAUSE MECHANICAL IRRITATION. LOW HAZARD FOR USUAL INDUSTRIAL HANDLING. INGESTION: INGESTION OF LARGE AMOUNTS MAY CAUSE GASTROINTESTINAL IRRITATION. EXPECTED TO BE A LOW INGESTION HAZARD. INHALATION: MAY CAUSE RESPIRATORY TRACT IRRITATION. MAY CAUSE LUNG DAMAGE.

Medical Condition Aggravated by Exposure: NONE SPECIFIED BY MANUFACTURER.

=====
===== First Aid Measures =====

First Aid: EYES: FLUSH WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES, OCCASIONALLY LIFTING THE UPPER & LOWER LIDS. GET MEDICAL AID. SKIN: FLUSH SKIN WITH PLENTY OF SOAP & WATER FOR AT LEAST 15 MINUTES WHILE REMOVING CONTAMINATED CLOTHING & SHOES. GET MEDICAL AID IF IRRITATION DEVELOPS OR PERSISTS. INGESTION: IF VICTIM IS CONSCIOUS AND ALERT, GIVE 2-4 CUPFULS OF MILK OR WATER. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON. GET MEDICAL AID. INHALATION: REMOVE FROM EXPOSURE TO FRESH AIR IMMEDIATELY. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN. GET MEDICAL AID IF COUGH OR OTHER SYMPTOMS APPEAR.

=====
===== Fire Fighting Measures =====

Lower Limits: N/A

Upper Limits: N/A

Extinguishing Media: SUBSTANCE IS NONCOMBUSTIBLE; USE AGENT MOST APPROPRIATE TO EXTINGUISH SURROUNDING FIRE.

Fire Fighting Procedures: AS IN ANY FIRE, WEAR A SELF-CONTAINED BREATHING APPARATUS IN PRESSURE-DEMAND, MSHA/NIOSH (APPROVED OR EQUIVALENT), AND FULL PROTECTIVE GEAR.

=====
===== Accidental Release Measures =====

Spill Release Procedures: VACUUM OR SWEEP UP MATERIAL AND PLACE INTO A SUITABLE DISPOSAL CONTAINER. AVOID GENERATING DUSTY CONDITIONS.

Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.

=====
===== Handling and Storage =====

Handling and Storage Precautions: USE WITH ADEQUATE VENTILATION. MINIMIZE DUST GENERATION AND ACCUMULATION. AVOID PROLONGED OR REPEATED CONTACT WITH SKIN. AVOID CONTACT WITH EYES. AVOID INGESTION AND INHALATION. STORE IN A TIGHTLY CLOSED CONTAINER. STORE IN A COOL, DRY, WELL-VENTILATED AREA AWAY FROM INCOMPATIBLE SUBSTANCES.

Other Precautions: CAUTION! MAY CAUSE RESPIRATORY AND DIGESTIVE TRACT IRRITATION. MAY CAUSE LUNG DAMAGE. MAY CAUSE MECHANICAL EYE AND SKIN IRRITATION. TARGET ORGANS: LUNGS.

=====
===== Exposure Controls/Personal Protection =====

Respiratory Protection: FOLLOW THE OSHA RESPIRATOR REGULATIONS FOUND IN

29CFR 1910.134 OR EUROPEAN STANDARD EN 149. ALWAYS USE A NIOSH OR EUROPEAN STANDARD EN 149 APPROVED RESPIRATOR WHEN NECESSARY.
Protective Gloves:WEAR APPROPRIATE GLOVES TO PREVENT SKIN EXPOSURE.
Eye Protection:WEAR APPROPRIATE PROTECTIVE EYEGLASSES OR CHEMICAL SAFETY GOGGLES.
Other Protective Equipment:WEAR APPROPRIATE PROTECTIVE CLOTHING TO PREVENT SKIN EXPOSURE.
Supplemental Safety and Health
NOTES TO PHYSICIAN: TREAT SYMPTOMATICALLY AND SUPPORTIVELY. ANTIDOTE: NONE REPORTED.

===== Physical/Chemical Properties =====

HCC:N1
Boiling Pt:=2980.C, 5396.F
Melt/Freeze Pt:=2000.C, #####F
Decomp Temp:Decomp Text:N/AV
Vapor Pres:NEGLIGIBLE
Vapor Density:N/AV
Spec Gravity:4.0 (WATER =1)
pH:N/AV
Viscosity:N/AV
Evaporation Rate & Reference:N/AV
Solubility in Water:NEGLIGIBLE IN WATER
Appearance and Odor:SOLID, WHITE, ODORLESS

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES
REACTS WITH CHLORINE TRIFLUORIDE OR ETHYLENE OXIDE.
Stability Condition to Avoid:INCOMPATIBLE MATERIALS.
Hazardous Decomposition Products:NONE
Conditions to Avoid Polymerization:HAS NOT BEEN REPORTED

===== Toxicological Information =====

Toxicological Information:LD50/LC50: NOT AVAILABLE. CARCINOGENICITY:
ACGIH-A4=NOT CLASSIFIABLE AS A HUMAN CARCINOGEN.
TERATOGENICITY/REPRODUCTIVE
EFFECTS/NEUROTOXICITY/MUTAGENICITY/OTHER STUDIES: NOT AVAILABLE.

===== Ecological Information =====

Ecological:ECOTOXICITY: NOT AVAILABLE. ENVIRONMENTAL FATE: NOT AVAILABLE. PHYSICAL/CHEMICAL: NOT AVAILABLE. OTHER: NOT AVAILABLE.

===== Disposal Considerations =====

Waste Disposal Methods:DISPOSE OF IN A MANNER CONSISTENT WITH FEDERAL, STATE & LOCAL REGULATIONS. RCRA D-SERIES: NONE LISTED. RCRA F-SERIES: NONE LISTED. RCRA P-SERIES: NONE LISTED. RCRA U-SERIES: NONE LISTED. NONE LISTED AS A MATERIAL BANNED FROM LAND DISPOSAL ACCORDING TO RCRA.

===== MSDS Transport Information =====

Transport Information:US DOT: NO INFORMATION AVAILABLE. IMO: NO

INFORMATION AVAILABLE. IATA: NO INFORMATION AVAILABLE. RID/ADR: NO INFORMATION AVAILABLE. CANADIAN TDQ: NO INFORMATION AVAILABLE.

=====
===== Regulatory Information =====

SARA Title III Information:SAARA 302 RQ: NONE OF THE CHMICALS IN THIS MATERIAL HAVE AN RQ. SECTION 302 TPQ: NONE OF THE CHMICALS IN THIS MATERIAL HAVE A TPQ. SECTION 313: CONTAINS ALUMINUM OXIDE (CAS# 1344-28-1; 100%); WHICH IS SUBJECT TO THE REPORTING REQUIREMENTS OF SECTION 313 OF SARA TITLE III & 40 CFR PART 373.

Federal Regulatory Information:RCRA D-SERIES: NONE LISTED. RCRA F-SERIES: NONE LISTED. RCRA P-SERIES: NONE LISTED. RCRA U-SERIES: NONE LISTED. NONE LISTED AS A MATERIAL BANNED FROM LAND DISPOSAL ACCORDING TO RCRA. TSCA: CAS# 1344- 28-1 IS LISTED ON THE TSCA INVENTORY. TSCA SNUR: NONE LISTED. CLEAN AIR ACT: THIS MATERIAL DOES NOT CONTAIN ANY HAZARDOUS AIR POLLUTERS. THIS MATERIAL DOES NOT CONTAIN ANY CLASS 1/CLASS 2 OZONE DEPLET ORS. CLEAN WATER ACT: NONE OF THE CHEMICALS IN THIS PRODUCT ARE LISTED AS HAZARDOUS SUBSTANCES UNDER THE CWA. NONE OF THE CHEMICALS IN THIS PRODUCT ARE LISTED AS PRIORITY POLLUTANTS UNDER THE CWA.

State Regulatory Information:ALUMINUM OXIDE CAN BE FOUND ON THE FOLLOWING STATE RIGHT TO KNOW LISTS: CALIFORNIA, NEW JERSEY, FLORIDA, PENNSYLVANIA, MINNESOTA, MASSACHUSETTS. CALIFORNIA NO SIGNIFIGANT RISK LEVEL: NONE OF THE CHEMI CALS IN THIS PRODUCT ARE LISTED.

=====
===== Other Information =====

Disclaimer (provided with this information by the compiling agencies): This information is formulated for use by elements of the Department of Defense. The United States of America in no manner whatsoever, expressly or implied, warrants this information to be accurate and disclaims all liability for its use. Any person utilizing this document should seek competent professional advice to verify and assume responsibility for the suitability of this information to their particular situation.

Material Safety Data Sheet

Aluminon

ACC# 00875

Section 1 - Chemical Product and Company Identification

MSDS Name: Aluminon

Catalog Numbers: S80255, S93110

Synonyms: Aurintricarboxylic acid ammonium salt;

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
569-58-4	Aluminon	100	209-319-1

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: red-brown solid.

Caution! May cause irritation. The toxicological properties of this material have not been fully investigated.

Target Organs: None.

Potential Health Effects

Eye: Dust may cause mechanical irritation.

Skin: May cause skin irritation. Low hazard for usual industrial handling.

Ingestion: Ingestion of large amounts may cause gastrointestinal irritation. The toxicological properties of this substance have not been fully investigated.

Inhalation: May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists. Wash clothing before reuse.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. This material in sufficient quantity and reduced particle size is capable of creating a dust explosion.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container.

Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Keep from contact with oxidizing materials. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep containers tightly closed.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Aluminon	none listed	none listed	none listed

OSHA Vacated PELs: Aluminon: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: red-brown

Odor: none reported

pH: Not available.
Vapor Pressure: Negligible.
Vapor Density: Not available.
Evaporation Rate: Negligible.
Viscosity: Not available.
Boiling Point: Not available.
Freezing/Melting Point: Not available.
Decomposition Temperature: Not available.
Solubility: Soluble in water.
Specific Gravity/Density: Not available.
Molecular Formula: C₂₂H₂₃N₃O₉
Molecular Weight: 473.1757

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Incompatible materials, dust generation.
Incompatibilities with Other Materials: Strong oxidizers.
Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, carbon dioxide.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 569-58-4: GU4800000
LD50/LC50:
CAS# 569-58-4:
Oral, rat: LD50 = 9 gm/kg;

Carcinogenicity:
CAS# 569-58-4: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.
Teratogenicity: No information available.
Reproductive Effects: No information available.
Mutagenicity: No information available.
Neurotoxicity: No information available.
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 569-58-4 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 569-58-4 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

WGK (Water Danger/Protection)

CAS# 569-58-4: No information available.

Canada - DSL/NDSL

CAS# 569-58-4 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Aluminum ammonium sulfate dodecahydrate

ACC# 00877

Section 1 - Chemical Product and Company Identification

MSDS Name: Aluminum ammonium sulfate dodecahydrate

Catalog Numbers: AC206260000, AC206260010, AC206260025, AC206260050, AC400540000, AC400545000, A567-500

Synonyms: Ammonium alum dodecahydrate.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7784-26-1	Aluminum ammonium sulfate dodecahydrate	>97	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid.

Caution! May cause eye, skin, and respiratory tract irritation. May cause liver damage.

Target Organs: Liver.

Potential Health Effects

Eye: Dust may cause mechanical irritation.

Skin: May cause skin irritation. Low hazard for usual industrial handling.

Ingestion: Causes gastrointestinal irritation with nausea, vomiting and diarrhea. May cause liver damage.

Inhalation: May cause respiratory tract irritation.

Chronic: Prolonged or repeated skin contact may cause irritation.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Substance is nonflammable; use agent most appropriate to extinguish surrounding fire.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container.

Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions.

Section 7 - Handling and Storage

Handling: Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with skin and eyes. Avoid ingestion and inhalation.

Storage: Store in a cool, dry place.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Good general ventilation should be sufficient to control airborne levels.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Aluminum ammonium sulfate dodecahydrate	2 mg/m ³ TWA (as Al) (listed under Aluminum, soluble salts).	2 mg/m ³ TWA (as Al) (listed under Aluminum, soluble salts).	none listed
Ammonium alum anhydrous	2 mg/m ³ TWA (as Al) (listed under Aluminum, soluble salts).	2 mg/m ³ TWA (as Al) (listed under Aluminum, soluble salts).	none listed

OSHA Vacated PELs: Aluminum ammonium sulfate dodecahydrate: No OSHA Vacated PELs are listed for this chemical. Ammonium alum anhydrous: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid
Appearance: white
Odor: odorless
pH: Not available.
Vapor Pressure: Negligible.
Vapor Density: Not available.
Evaporation Rate: Negligible.
Viscosity: Not available.
Boiling Point: 120 deg C
Freezing/Melting Point: 94.4 deg C
Decomposition Temperature: 280 deg C
Solubility: 150 g/l (20 C)
Specific Gravity/Density: 1.6 (water=1)
Molecular Formula: AlNH₄S₂O₈·12H₂O
Molecular Weight: 453.2922

Section 10 - Stability and Reactivity

Chemical Stability: Stable.
Conditions to Avoid: None reported.
Incompatibilities with Other Materials: None reported.
Hazardous Decomposition Products: Nitrogen oxides, oxides of sulfur, ammonia and/or derivatives.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 7784-26-1: WS5640010
CAS# 7784-25-0 unlisted.
LD50/LC50:
Not available.
Not available.

Carcinogenicity:
CAS# 7784-26-1: Not listed by ACGIH, IARC, NTP, or CA Prop 65.
CAS# 7784-25-0: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No data available.
Teratogenicity: No data available.
Reproductive Effects: No data available.
Mutagenicity: No data available.
Neurotoxicity: No data available.
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.
RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7784-26-1 is not on the TSCA Inventory because it is a hydrate. It is considered to be listed if the CAS number for the anhydrous form is on the inventory (40CFR720.3(u)(2)).

CAS# 7784-25-0 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 7784-26-1: immediate.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7784-26-1 can be found on the following state right to know lists: California, (listed as Aluminum, soluble salts), Pennsylvania, (listed as Aluminum, soluble salts), Minnesota, (listed as Aluminum, soluble salts).

CAS# 7784-25-0 can be found on the following state right to know lists: California, (listed as Aluminum, soluble salts), Pennsylvania, (listed as Aluminum, soluble salts), Minnesota, (listed as Aluminum, soluble salts).

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:**WGK (Water Danger/Protection)**

CAS# 7784-26-1: 1

CAS# 7784-25-0: No information available.

Canada - DSL/NDSL

CAS# 7784-26-1 is listed on Canada's DSL List.

CAS# 7784-25-0 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 7784-26-1 (listed as Aluminum, soluble salts) is listed on the Canadian Ingredient Disclosure List.

CAS# 7784-25-0 (listed as Aluminum, soluble salts) is listed on the Canadian Ingredient Disclosure List.

FISHER SCIENTIFIC -- A-581, ALUMINUM HYDROXIDE -- 6810-00N030952

=====
===== Product Identification =====

Product ID:A-581, ALUMINUM HYDROXIDE
MSDS Date:04/26/1985
FSC:6810
NIIN:00N030952
MSDS Number: BPGWL
=== Responsible Party ===
Company Name:FISHER SCIENTIFIC
Address:1 REAGENT LANE
City:FAIR LAWN
State:NJ
ZIP:07410-2802
Country:US
Info Phone Num:201-796-7100
Emergency Phone Num:201-796-7100
CAGE:1B464

==== Contractor Identification ===
Company Name:FISHER SCIENTIFIC CO. CHEMICAL MFG DIV
Address:1 REAGENT LANE
Box:City:FAIRLAWN
State:NJ
ZIP:07410-2802
Country:US
Phone:201-796-7100
CAGE:1B464

=====
===== Composition/Information on Ingredients =====

Ingred Name:ALUMINUM HYDROXIDE
CAS:21645-51-2
RTECS #:BD0940000
Fraction by Wt: 100%
OSHA PEL:2 MG(AL)/M3
ACGIH TLV:2 MG(AL)/M3

=====
===== Hazards Identification =====

LD50 LC50 Mixture:NONE SPECIFIED BY MANUFACTURER.
Routes of Entry: Inhalation:YES Skin:NO Ingestion:YES
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:ACUTE: INHAL: INHAL MAY PRODUCE IRRIT
& COUGHING. SKIN: SUBSTANCE HAS LOW LEVEL OF TOX. PROLONGED
EXPOSURE TO DUST MAY CAUSE IRRIT. EYE: DIRECT CONTACT MAY CAUSE
REDNESS & IRRIT. INGEST: GREATEST DANG ER FROM INGESTION OF LARGE
QTY OF THIS SUBSTANCE IS INTESTINAL OBSTRUCTION. CHRONIC: INHAL:
MAY CAUSE (EFTS OF OVEREXP)
Explanation of Carcinogenicity:NOT RELEVANT
Effects of Overexposure:HLTH HAZ: MUC MEMB IRRIT. SKIN: NONE REPORTED
IN HUMANS. EYE: MAY CAUSE CONJUNCTIVITIS.
Medical Cond Aggravated by Exposure:NONE SPECIFIED BY MANUFACTURER.

=====
===== First Aid Measures =====

First Aid:INHAL: REMOVE FROM EXPOS TO FRESH AIR IMMED. IF BRTHG HAS STOPPED, GIVE ARTF RESP. KEEP PERSON WARM & @ REST. GET MED ATTN. SKIN: REMOVE CONTAMD CLTHG & SHOES IMMED. WASH AFFECTED AREA W/SOAP/ MILD DE TERGENT & LG AMTS OF H2O(APPROX 15-20 MIN) UNTIL NO EVIDENCE OF CHEM REMAINS. GET MED ATTN. EYE: WASH IMMED W/LG AMTS OF H2O, OCCAS LIFT LIDS, UNTIL NO EVIDENCE OF CHEM (SUPP DATA)

=====
===== Fire Fighting Measures =====

Flash Point:NON-FLAMMABLE
Extinguishing Media:DRY CHEM, CO2, WATER SPRAY OR FOAM. FOR LARGER FIRES, USE WATER SPRAY, FOG OR ALCOHOL FOAM.
Fire Fighting Procedures:WEAR NIOSH/MSHA APPROVED SCBA AND FULL PROTECTIVE EQUIPMENT . MOVE CONTAINER FROM AREA IF POSSIBLE. AVOID BREATHING VAPORS OR DUSTS; KEEP UPWIND.
Unusual Fire/Explosion Hazard:NEGLIGIBLE FIRE AND NEGLIGIBLE EXPLOSION HAZARD IN DUST FORM WHEN EXPOSED TO HEAT OR FLAME.

=====
===== Accidental Release Measures =====

Spill Release Procedures:ABSORB WITH VERMICULITE OR OTHER SUITABLE MATERIAL, SCOOP UP AND PLACE IN A SUITABLE CONTAINER (FIBER BOARD OR PLASTIC) FOR LATER DISPOSAL.
Neutralizing Agent:NONE SPECIFIED BY MANUFACTURER.

=====
===== Handling and Storage =====

Handling and Storage Precautions:NONE SPECIFIED BY MANUFACTURER.
Other Precautions:NONE SPECIFIED BY MANUFACTURER.

=====
===== Exposure Controls/Personal Protection =====

Respiratory Protection:200 MG(AL)/M3-NIOSH/MSHA APPRVD HIGH-EFFICIENCY PARTICULATE RESPIRATOR W/FULL FACE-PIECE.
Ventilation:PROVIDE LOCAL EXHAUST VENTILATION OR GENERAL DILUTION VENTILATION TO MEET PERMISSIBLE EXPOSURE LIMITS.
Protective Gloves:IMPERVIOUS GLOVES .
Eye Protection:CHEMICAL WORKERS GOGGLES .
Other Protective Equipment:PROT CLTHG NOT REQD. AVOID REPEATED OR PROLONGED CONTACT WITH SUBSTANCE.
Work Hygienic Practices:NONE SPECIFIED BY MANUFACTURER.
Supplemental Safety and Health
HMIS(LEVIEN) NOTES THAT TDLO(HUMAN) IS 79-122MG/KG.MATL TO AVOID: W/BISMUTH HYDROXIDE & REDUCED BY HYDROGEN @ 170-210C, IT IS SPONTANEOUSLY FLAMM IN AIR @ ORDINARY TEMP. FIRST AID PROC: REMAINS (15-20 MIN). GET MED ATTN. INGEST: IF CONSCIOUS, IMMED GIVE 2-4 GLASSES OF H2O,INDUCE VOMIT BY TOUCHING FINGER BACK OF THROAT.

=====
===== Physical/Chemical Properties =====

HCC:T6
Melt/Freeze Pt:M.P/F.P Text:572F,300C
Spec Gravity:2.4
Solubility in Water:INSOLUBLE
Appearance and Odor:WHITE CRYSTALLINE POWDER, GRANULES OR GELETINOUS

=====
===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid: YES
CHLORINATED RUB: REACTS VIOLENTLY. BISMUTH HYDROXIDE & HYDROGEN: WHEN
ALUMINUM HYDROXIDE IS CO-PRECIPITATED (SUPP DATA)
Stability Condition to Avoid: NONE SPECIFIED BY MANUFACTURER.
Hazardous Decomposition Products: THERMAL DECOMPOSITION MAY RELEASE
ACRID SMOKE AND IRRITATING FUMES.

===== Disposal Considerations =====

Waste Disposal Methods: DISPOSE OF IN ACCORDANCE WITH FEDERAL, STATE AND
LOCAL REGULATIONS .

Disclaimer (provided with this information by the compiling agencies):
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assume responsibility for the suitability of this information to their
particular situation.

Material Safety Data Sheet

Aluminum nitrate

ACC# 00940

Section 1 - Chemical Product and Company Identification

MSDS Name: Aluminum nitrate

Catalog Numbers: S70418, S71913, S93114

Synonyms: Aluminum trinitrate; nitric acid aluminum salt

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
13473-90-0	Aluminum nitrate	100	236-751-8

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: colorless to white solid.

Danger! Strong oxidizer. Contact with other material may cause a fire. Causes eye, skin, and respiratory tract irritation. May be harmful if swallowed. May cause methemoglobinemia.

Target Organs: Eyes.

Potential Health Effects

Eye: Causes eye irritation. May cause conjunctivitis.

Skin: Causes skin irritation.

Ingestion: Ingestion of large amounts may cause gastrointestinal irritation. May cause methemoglobinemia, cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood), convulsions, and death. Methemoglobinemia is characterized by dizziness, drowsiness, headache, shortness of breath, cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood), rapid heart rate and chocolate-brown colored blood.

Inhalation: May cause respiratory tract irritation. May cause methemoglobinemia, cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood), convulsions, tachycardia, dyspnea (labored breathing), and death. May cause acute pulmonary edema, asphyxia, chemical pneumonitis, and upper airway obstruction caused by edema.

Chronic: Effects may be delayed.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Use water with caution and in flooding amounts. Oxidizer. Greatly increases the burning rate of combustible materials. Some oxidizers may react explosively with hydrocarbons(fuel). May accelerate burning if involved in a fire. Containers may explode when heated.

Extinguishing Media: In case of fire, use water, dry chemical, chemical foam, or alcohol-resistant foam. Contact professional fire-fighters immediately.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower:Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 0; Special Hazard: OX

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Remove all sources of ignition. Do not use combustible materials such as paper towels to clean up spill.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Minimize dust generation and accumulation. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Do not get on skin or in eyes. Avoid ingestion and inhalation. Keep from contact with clothing and other combustible materials. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames.

Storage: Keep away from heat, sparks, and flame. Do not store near combustible materials. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from flammable liquids.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Aluminum nitrate	2 mg/m ³ TWA (as Al) (listed under Aluminum, soluble salts).	2 mg/m ³ TWA (as Al) (listed under Aluminum, soluble salts).	none listed

OSHA Vacated PELs: Aluminum nitrate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by

OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear a chemical apron. Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: colorless to white

Odor: odorless

pH: Acidic in solution.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: 150 deg C

Freezing/Melting Point: 73.9 deg C

Decomposition Temperature: 150 deg C

Solubility: 64 g/100ml (25°C)

Specific Gravity/Density: >1

Molecular Formula: Al(NO₃)₃

Molecular Weight: 212.9962

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, ignition sources, dust generation, combustible materials, reducing agents.

Incompatibilities with Other Materials: Reducing agents.

Hazardous Decomposition Products: Nitrogen oxides, aluminum oxide, aluminum fumes.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:**CAS#** 13473-90-0: BD1040000**LD50/LC50:**

CAS# 13473-90-0:

Draize test, rabbit, eye: 100 mg Severe;

Draize test, rabbit, skin: 500 mg Mild;

Draize test, rabbit, skin: 10%/6D (Intermittent);

Oral, mouse: LD50 = 370 mg/kg;

Oral, rat: LD50 = 204 mg/kg;

Carcinogenicity:

CAS# 13473-90-0: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No data available.**Teratogenicity:** No data available.**Reproductive Effects:** No data available.**Mutagenicity:** No data available.**Neurotoxicity:** No data available.**Other Studies:**

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.**RCRA U-Series:** None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	ALUMINUM NITRATE	ALUMINUM NITRATE

Hazard Class:	5.1	5.1
UN Number:	UN1438	UN1438
Packing Group:	III	III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 13473-90-0 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313

This material contains Aluminum nitrate (listed as Water Dissociable Nitrate Compounds), 100%, (CAS# 13473-90-0) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 13473-90-0 can be found on the following state right to know lists: California, (listed as Aluminum, soluble salts), New Jersey, Pennsylvania, (listed as Aluminum, soluble salts), Minnesota, (listed as Aluminum, soluble salts).

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XN O

Risk Phrases:

R 22 Harmful if swallowed.

R 36 Irritating to eyes.

R 8 Contact with combustible material may cause fire.

Safety Phrases:

S 17 Keep away from combustible material.

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

WGK (Water Danger/Protection)

CAS# 13473-90-0: 1

Canada - DSL/NDSL

CAS# 13473-90-0 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of C, D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 13473-90-0 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Aluminum potassium sulfate dodecahydrate

ACC# 19200

Section 1 - Chemical Product and Company Identification

MSDS Name: Aluminum potassium sulfate dodecahydrate

Catalog Numbers: AC217480000, AC217480010, AC217485000, AC423260000, AC423260010, AC423260030, AC423260050, AC423265000, A601-3, A601-500, A605-12, A605-212, A605-500

Synonyms: Alum; Aluminum potassium sulfate, dodecahydrate; Kalinite; Potassium alum; Sulfuric acid, aluminum potassium salt.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7784-24-9	Aluminum potassium sulfate dodecahydrate	100	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white crystals.

Warning! Irritant. Harmful if swallowed. Causes eye and skin irritation. May cause respiratory tract irritation.

Target Organs: Eyes, skin.

Potential Health Effects

Eye: Causes eye irritation. May cause chemical conjunctivitis.

Skin: Causes skin irritation. May be harmful if absorbed through the skin.

Ingestion: Harmful if swallowed. Ingestion of large amounts may cause gastrointestinal irritation.

Inhalation: Causes respiratory tract irritation. May be harmful if inhaled.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: In case of fire, use water, dry chemical, chemical foam, or alcohol-resistant foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up, then place into a suitable container for disposal. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation. Wash clothing before reuse. Discard contaminated shoes.

Storage: Store in a cool, dry place. Keep containers tightly closed.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Aluminum potassium sulfate dodecahydrate	none listed	2 mg/m ³ TWA (as Al) (listed under Aluminum, soluble salts).	none listed
Potassium aluminum sulfate	none listed	2 mg/m ³ TWA (as Al) (listed under Aluminum, soluble salts).	none listed

OSHA Vacated PELs: Aluminum potassium sulfate dodecahydrate: No OSHA Vacated PELs are listed for this chemical. Potassium aluminum sulfate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Crystals

Appearance: white

Odor: odorless

pH: 3.0-3.5 (10% aq soln)

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Evaporation Rate: Not applicable.

Viscosity: Not applicable.

Boiling Point: Not available.

Freezing/Melting Point: 92 deg C

Decomposition Temperature: 200 deg C

Solubility: Partially soluble.

Specific Gravity/Density: 1.757

Molecular Formula: $\text{AlK}(\text{SO}_4)_2 \cdot 12\text{H}_2\text{O}$

Molecular Weight: 474.3558

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, dust generation.

Incompatibilities with Other Materials: Aluminum, copper, steel, zinc, strong oxidizing agents.

Hazardous Decomposition Products: Oxides of sulfur, aluminum oxide, oxides of potassium.

Hazardous Polymerization: Has not been reported

Section 11 - Toxicological Information

RTECS#:

CAS# 7784-24-9: WS5690000

CAS# 10043-67-1: WS5650000

LD50/LC50:

Not available.
Not available.

Carcinogenicity:

CAS# 7784-24-9: Not listed by ACGIH, IARC, NTP, or CA Prop 65.
CAS# 10043-67-1: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found
Teratogenicity: No information found
Reproductive Effects: No information found
Mutagenicity: No information found
Neurotoxicity: No information found
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.
RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	Not Regulated
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7784-24-9 is not on the TSCA Inventory because it is a hydrate. It is considered to be listed if the CAS number for the anhydrous form is on the inventory (40CFR720.3(u)(2)).

CAS# 10043-67-1 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 7784-24-9: delayed.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7784-24-9 can be found on the following state right to know lists: California, (listed as Aluminum, soluble salts), Pennsylvania, (listed as Aluminum, soluble salts), Minnesota, (listed as Aluminum, soluble salts).

CAS# 10043-67-1 can be found on the following state right to know lists: California, (listed as Aluminum, soluble salts), Pennsylvania, (listed as Aluminum, soluble salts), Minnesota, (listed as Aluminum, soluble salts).

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations
European Labeling in Accordance with EC Directives
Hazard Symbols:

XN

Risk Phrases:

R 22 Harmful if swallowed.

R 36/38 Irritating to eyes and skin.

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 37/39 Wear suitable gloves and eye/face protection.

WGK (Water Danger/Protection)

CAS# 7784-24-9: No information available.

CAS# 10043-67-1: 1

Canada - DSL/NDSL

CAS# 10043-67-1 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 7784-24-9 (listed as Aluminum, soluble salts) is listed on the Canadian Ingredient Disclosure List.

CAS# 10043-67-1 (listed as Aluminum, soluble salts) is listed on the Canadian Ingredient Disclosure List.

SIGMA CHEMICAL CO -- ALUMINUM CHLORIDE HEXAHYDRATE, A3017 -- 6810-00N041935

=====
===== Product Identification =====

Product ID:ALUMINUM CHLORIDE HEXAHYDRATE, A3017
MSDS Date:01/30/1992
FSC:6810
NIIN:00N041935
MSDS Number: BSVBZ
=== Responsible Party ===
Company Name:SIGMA CHEMICAL CO
Box:14508
City:SAINT LOUIS
State:MO
ZIP:63178
Country:US
Info Phone Num:800-325-3010; 314-771-5750
Emergency Phone Num:314-771-5767
CAGE:21076

==== Contractor Identification ===
Company Name:SIGMA CHEMICAL COMPANY
Address:3050 SPRUCE ST
Box:14508
City:ST LOUIS
State:MO
ZIP:63178
Country:US
Phone:314-771-5765
CAGE:21076

=====
===== Composition/Information on Ingredients =====

Ingred Name:ING 3:STEP DECOMP RXN OCCURRING >90C, WHICH
SELF-ACCELERATES W/HIGH EXOTHERMICALLY PRDCG AZO- & AZOXYPOLYMERS.
RTECS #:9999999ZZ

Ingred Name:MATLS TO AVOID:CHLORIDE & NAPHTHALENE, MIXT OF ANILIINE &
ETHYLENEIMINE, ETHYLENE OXIDE, MIXT OF SODIUM PEROXIDE (ING 6)
RTECS #:9999999ZZ

Ingred Name:ING 5:& ALUMINUM. ALUMINUM CHLORIDE REACTS EXPLOSIVELY
WITH:OXYGEN DIFLUORIDE, PHENYL AZIDE, PERCHLORYL BENZENE/ (ING 7)
RTECS #:9999999ZZ

Ingred Name:ING 6:SODIUM BOROHYDRIDE. MIXTS OF ALUMINUM CHLORIDE &
NITROMETHANE REACT EXPLOSIVELY ON CONT W/ALKENES/CARBON (ING 8)
RTECS #:9999999ZZ

Ingred Name:ING 7:MONOXIDE & PHENOL.
RTECS #:9999999ZZ

Ingred Name:WASTE DISP METH:WHICH CAN BE CONTROLLED BY THE RATE OF
ADDITION. OBSERVE ALL FEDERAL, STATE & LOCAL LAWS.
RTECS #:9999999ZZ

Ingred Name:ALUMINUM CHLORIDE, HEXAHYDRATE

CAS:7784-13-6
RTECS #:BD0530000

Ingred Name:SUPDAT:OF DESORBED HYDROGEN CHLORIDE, BUT ALSO BY NEAR
DOUBLING IN VOL WHICH OCCURS WHEN MATL MELTS TO MONOMER. (ING 3)
RTECS #:9999999ZZ

Ingred Name:ING 2:MIXTS OF NITROBENZENE & ALUMINUM CHLORIDE ARE
THERMALLY UNSTABLE & MAY LEAD TO EXPLO DECOMP DUE TO MULTI- (ING 4)
RTECS #:9999999ZZ

=====
===== Hazards Identification =====

LD50 LC50 Mixture:LD50:(ORAL,RAT) 3311 MG/KG.
Routes of Entry: Inhalation:YES Skin:YES Ingestion:YES
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:ACUTE:MAY BE HARMFUL BY INHALATION,
INGESTION OR SKIN ABSORPTION. CAUSES EYE & SKIN IRRITATION.
MATERIAL IS IRRITATING TO MUCOUS MEMBRANES & UPPER RESPIRATORY
TRACT. TO THE BEST OF OUR KNOWLEDGE, THE CHEMICAL, PHYSICAL AND
TOXICOLOGICAL PROPERTIES HAVE NOT BEEN THOROUGHLY INVESTIGATED.
Explanation of Carcinogenicity:NOT RELEVANT
Effects of Overexposure:SEE HEALTH HAZARDS.
Medical Cond Aggravated by Exposure:NONE SPECIFIED BY MANUFACTURER.

=====
===== First Aid Measures =====

First Aid:INGEST:CALL MD IMMEDIATELY . EYES:IMMEDIATELY FLUSH W/COPIOUS
AMOUNTS OF WATER FOR AT LEAST 15 MINUTES. SKIN:IMMEDIATELY WASH
W/SOAP & COPIOUS AMOUNTS OF WATER. WASH CONTAMINATED CLOTHING
BEFORE REUSE. INHAL:REMOVE TO FRESH AIR. IF NOT BREATHING GIVE
ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN.
CALL MD.

=====
===== Fire Fighting Measures =====

Extinguishing Media:CARBON DIOXIDE, DRY CHEMICAL POWDER, ALCOHOL OR
POLYMER FOAM.
Fire Fighting Procedures:WEAR NIOSH/MSHA APPROVED SCBA & FULL
PROTECTIVE EQUIPMENT .
Unusual Fire/Explosion Hazard:EMITS TOXIC FUMES UNDER FIRE CNDTNS. THE
ANHYDROUS FORM OF THIS MATL HAS BEEN REPORTED TO HAVE FOLLOWING
HAZS ASSOC W/IT. PRLNG STOR OF ANHYDROUS (SUPP DATA)

=====
===== Accidental Release Measures =====

Spill Release Procedures:EVACUATE AREA. WEAR NIOSH/MSHA APPROVED
RESPIRATOR, CHEMICAL SAFETY GOGGLES, RUBBER BOOTS & HEAVY RUBBER
GLOVES. SWEEP UP, PLACE IN A BAG & HOLD FOR WASTE DISPOSAL. AVOID
RAISING DUST. VENTILATE AREA & WASH SPILL SITE AFTER MATL PICKUP
IS COMPLETE.
Neutralizing Agent:NONE SPECIFIED BY MANUFACTURER.

=====
===== Handling and Storage =====

Handling and Storage Precautions:DO NOT BREATHE DUST. AVOID CONTACT
W/EYES, SKIN & CLOTHING. AVOID PROLONGED OR REPEATED EXPOSURE.

IRRITANT. HARMFUL DUST. KEEP TIGHTLY CLOSED.
Other Precautions:MOISTURE SENSITIVE. STORE IN A COOL DRY PLACE.

=====
===== Exposure Controls/Personal Protection =====

Respiratory Protection:WEAR APPROPRIATE NIOSH/MSHA APPROVED RESPIRATOR.
Ventilation:MECHANICAL EXHAUST REQUIRED.
Protective Gloves:CHEMICAL-RESISTANT GLOVES.
Eye Protection:ANSI APRV CHEM WORK GOGG .
Other Protective Equipment:OTHER PROTECTIVE CLOTHING. SAFETY SHOWER &
EYE BATH WHICH MEETS ANSI DESIGN CRITERIA .
Work Hygienic Practices:WASH THOROUGHLY AFTER HANDLING.
Supplemental Safety and Health
EXPLO HAZ:ALUMINUM CHLORIDE IN CLSD CNTNRS HAS RESULTED IN SPONT DECOMP
& OCCAS EXPLO UPON OPENING CNTNR PROB DUE TO DIFFUSION OF MOISTURE
INTO CNTNR W/RESULTING PRESS BUILD-UP DUE TO LIBERATED HYDROG EN
CHLORIDE GAS. WHEN HEATED IN SEALED TUBE, HIGH INTERNAL PRESS MAY
BE GEN DUE TO NOT ONLY ITS VAP PRESS & PRESS(ING 2)

=====
===== Physical/Chemical Properties =====

HCC:T6
Vapor Pres:1 @ 100C
Spec Gravity:2.398
Appearance and Odor:MOIST WHITE CRYSTALS.

=====
===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES
STRONG ACIDS. VIOLENT EXOTHERMIC RXNS CAN OCCUR UPON ALUMINUM CHLORIDE
CONTACTING:ALKENES, MIXT OF BENZOYL (ING 5)
Stability Condition to Avoid:MAY DECOMPOSE ON EXPOSURE TO MOIST AIR OR
WATER.
Hazardous Decomposition Products:HYDROGEN CHLORIDE GAS, ALUMINUM OXIDE.

=====
===== Disposal Considerations =====

Waste Disposal Methods:FOR SM QTYS:CAUTIOUSLY ADD TO LG STIRRED EXCESS
OF WATER. ADJUST PH TO NEUTRAL, SEPARATE ANY INSOL SOLIDS/LIQS &
PACKAGE THEM FOR HAZ-WASTE DISP. FLUSH AQUEOUS SOLN DOWN DRAIN
W/PLENTY OF WATER. HYDRO LYSIS & NEUT RXNS MAY GEN HEAT & FUMES
(ING 9)

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assume responsibility for the suitability of this information to their
particular situation.

Material Safety Data Sheet

Aluminum Oxide, 99%

ACC# 95871

Section 1 - Chemical Product and Company Identification

MSDS Name: Aluminum Oxide, 99%

Catalog Numbers: AC215700000, AC215700010, AC215700250, AC215702500

Synonyms: Aluminum Oxide; Morin Dyed; Alumina.

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
1344-28-1	Aluminum oxide	99	215-691-6

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white.

Caution! May cause mechanical eye and skin irritation. May cause respiratory tract irritation. May cause lung damage.

Target Organs: Lungs.

Potential Health Effects

Eye: Dust may cause mechanical irritation.

Skin: Dust may cause mechanical irritation. Low hazard for usual industrial handling.
Ingestion: Ingestion of large amounts may cause gastrointestinal irritation. Expected to be a low ingestion hazard.
Inhalation: May cause respiratory tract irritation. May cause lung damage.
Chronic: Chronic inhalation of fine dusts may cause lung damage.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.
Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists. Wash clothing before reuse.
Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.
Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.
Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.
Extinguishing Media: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire.
Flash Point: Not applicable.
Autoignition Temperature: Not applicable.
Explosion Limits, Lower: Not available.
Upper: Not available.
NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Wash thoroughly after handling. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid prolonged or repeated contact with skin. Avoid contact with eyes. Do not ingest or inhale.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Aluminum oxide	10 mg/m ³ TWA (particulate matter containing no asbestos and <1% crystalline silica)	none listed	15 mg/m ³ TWA (total dust); 5 mg/m ³ TWA (respirable fraction)

OSHA Vacated PELs: Aluminum oxide: 10 mg/m³ TWA (total dust); 5 mg/m³ TWA (respirable fraction)

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid
Appearance: white
Odor: Odorless.
pH: Not available.
Vapor Pressure: Negligible.
Vapor Density: Not available.
Evaporation Rate:Not available.
Viscosity: Not available.
Boiling Point: 2980 deg C
Freezing/Melting Point:2000 deg C
Decomposition Temperature:Not available.
Solubility: Negligible in water.
Specific Gravity/Density:4.0 (water=1)
Molecular Formula:Al₂O₃
Molecular Weight:101.9612

Section 10 - Stability and Reactivity

Chemical Stability: Stable.
Conditions to Avoid: Incompatible materials.
Incompatibilities with Other Materials: Reacts with chlorine trifluoride or ethylene oxide. Exothermic reaction above 200C with halocarbon vapors produces toxic hydrogen chloride and phosgene.
Hazardous Decomposition Products: Hydrogen chloride, phosgene, none.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 1344-28-1: BD1200000
LD50/LC50:
Not available.

Carcinogenicity:
CAS# 1344-28-1: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.
Teratogenicity: No information available.
Reproductive Effects: No information available.
Mutagenicity: No information available.
Neurotoxicity: No information available.
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 1344-28-1 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313

This material contains Aluminum oxide (CAS# 1344-28-1, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 1344-28-1 can be found on the following state right to know lists: New Jersey, Pennsylvania, Minnesota, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 1344-28-1: 0

Canada - DSL/NDSL

CAS# 1344-28-1 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of Not controlled..

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 1344-28-1 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Aluminum sulfate

ACC# 00980

Section 1 - Chemical Product and Company Identification

MSDS Name: Aluminum sulfate

Catalog Numbers: AC192430000, AC192430050

Synonyms: Aluminum trisulfate; Dialuminum sulphate; Sulfuric acid aluminum salt

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
10043-01-3	Aluminum sulfate	99	233-135-0

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid.

Caution! May cause eye, skin, and respiratory tract irritation. Hygroscopic (absorbs moisture from the air). This is expected to be a low hazard for usual industrial handling.

Target Organs: None.

Potential Health Effects

Eye: Dust may cause mechanical irritation.

Skin: May cause skin irritation. Low hazard for usual industrial handling.

Ingestion: Ingestion of large amounts may cause gastrointestinal irritation. Expected to be a low ingestion hazard.

Inhalation: May cause respiratory tract irritation. Low hazard for usual industrial handling.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists. Wash clothing before reuse.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use only in a well-ventilated area. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Store in a tightly closed container. Keep from contact with oxidizing materials. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from water. Store protected from moisture.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Aluminum sulfate	2 mg/m ³ TWA (as Al) (listed under Aluminum, soluble salts).	2 mg/m ³ TWA (as Al) (listed under Aluminum, soluble salts).	none listed

OSHA Vacated PELs: Aluminum sulfate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white

Odor: none reported
pH: >2.9 at 5% solution.
Vapor Pressure: Negligible.
Vapor Density: Not available.
Evaporation Rate: Negligible.
Viscosity: Not available.
Boiling Point: Not available.
Freezing/Melting Point: 770 deg C
Decomposition Temperature: 770 deg C
Solubility: Soluble.
Specific Gravity/Density: 2.7 (water=1)
Molecular Formula: Al₂(SO₄)₃
Molecular Weight: 342.1358

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures. Hygroscopic: absorbs moisture or water from the air.
Conditions to Avoid: Dust generation, exposure to moist air or water.
Incompatibilities with Other Materials: No significant incompatibilities identified with common materials and contaminants..
Hazardous Decomposition Products: Oxides of sulfur, aluminum oxide.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 10043-01-3: BD1700000
LD50/LC50:
CAS# 10043-01-3:
Draize test, rabbit, eye: 10 mg/24H Severe;
Oral, mouse: LD50 = 6207 mg/kg;

Carcinogenicity:
CAS# 10043-01-3: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found
Teratogenicity: No information found
Reproductive Effects: No information found
Mutagenicity: No information found
Neurotoxicity: No information found
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 10043-01-3 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 10043-01-3: 5000 lb final RQ; 2270 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 10043-01-3: immediate, delayed.

Section 313 No chemicals are reportable under Section 313.**Clean Air Act:**

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

CAS# 10043-01-3 is listed as a Hazardous Substance under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 10043-01-3 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, (listed as Aluminum, soluble salts), Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

Not available.

Risk Phrases:**Safety Phrases:****WGK (Water Danger/Protection)**

CAS# 10043-01-3: 1

Canada - DSL/NDSL

CAS# 10043-01-3 is listed on Canada's DSL List.

Canada - WHMIS

not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 10043-01-3 (listed as Aluminum, soluble salts) is listed on the Canadian Ingredient Disclosure List.

PLATT BROTHERS AND COMPANY -- ZINC/ALUMINUM BASE ALLOYS IN WIRE, RODS, BARS, STRIPS, COILS
-- 8010-01-439-7910

=====
===== Product Identification =====

Product ID:ZINC/ALUMINUM BASE ALLOYS IN WIRE, RODS, BARS, STRIPS, COILS
MSDS Date:09/15/1988
FSC:8010
NIIN:01-439-7910
Status Code:A
MSDS Number: CKKGX
=== Responsible Party ===
Company Name:PLATT BROTHERS AND COMPANY
Address:2670 S MAIN STREET
City:WATERBURY
State:CT
ZIP:06721
Country:US
Info Phone Num:203-753-4194
Emergency Phone Num:0000000000
CAGE:77315

=== Contractor Identification ===

Company Name:PLATT BROTHERS AND COMPANY
Address:2670 S MAIN STREET
Box:City:WATERBURY
State:CT
ZIP:06721
Country:US
Phone:203-753-4194
CAGE:77315

=====
===== Composition/Information on Ingredients =====

Ingred Name:ZINC
CAS:1314-13-2
RTECS #:ZH4810000
Fraction by Wt: 80-99%
ACGIH TLV:1.0 AS FUME MG/M3

Ingred Name:ALUMINUM
CAS:7429-90-5
RTECS #:BD0330000
Fraction by Wt: 0-16.5%
ACGIH TLV:10 MG/M3

Ingred Name:CADMIUM
CAS:7440-43-9
RTECS #:EU9800000
Fraction by Wt: 0-0.005%
ACGIH TLV:10MG/M3
EPA Rpt Qty:10 LBS
DOT Rpt Qty:10 LBS

Ingred Name:COPPER
CAS:7440-50-8
RTECS #:GL5325000

Fraction by Wt: --0.75%
ACGIH TLV:0.2 AS FUME
EPA Rpt Qty:5000 LBS
DOT Rpt Qty:5000 LBS

Ingred Name:IRON
CAS:7439-89-6
RTECS #:NO4565500
Fraction by Wt: 0-0.75%
ACGIH TLV:5.0 AS FUME

Ingred Name:LEAD
CAS:7439-92-1
RTECS #:OF7525000
Fraction by Wt: 0-0.07%
ACGIH TLV:0.05 AS DUST OR FUME
EPA Rpt Qty:1 LB
DOT Rpt Qty:1 LB

Ingred Name:TITANIUM
CAS:7440-32-6
RTECS #:XR1700000
Fraction by Wt: 0-0.002%
ACGIH TLV:10.0 AS DIOXIDE

=====
===== Hazards Identification =====

Health Hazards Acute and Chronic:ACUTE EXPOSURE TO ZINC/ALUMINUM DUST OR FUME MAY CAUSE IRRITATION TO THE EYES, NOSE OR THROAT; LEAVE A METALLIC TASTE IN THE MOUTH; RESULT IN METAL FUME FEVER; OR PRODUCE FLU-LIKE SYMPTOMS. UNDER NOR MAL HANDLING CONDITIONS THE SOLID ALLOY PRESENTS NO SIGNIFICANT HEALTH HAZARDS. PROCESSING OF THE ALLOY BY DUST OR FUME PRODUCING OPERATIONS (GRINDING, BUFFING, SAWING, FORGING, CUTTING, WELDING, ET C.) MAY RESULT IN THE POTENTIAL FOR EXPOSURE TO AIRBORN METAL PARTICULATES OR FUME. THE EXPOSURE LEVELS IN SECTION 1 ARE RELEVANT TO FUMES AND DUSTS. CHRONIC OVEREXPOSURE TO: ALUMINUM: MAY INITI ATE FIBROTIC CHANGES TO LUNG TISSUE. *

Effects of Overexposure:*CADMIUM: LOSS OF SMELL, ULCERATION OF THE NOSE, SHORTNESS OF BREATH, (EMPHYSEMA) KIDNEY DAMAGE, AND MILD ANEMIA, ALSO REPORTED TO CAUSE AN INCREASED INCIDENCE OF CANCER OF THE PROSTATE IN MEN. CO PPER: NO CHRONIC DEBILITATING SYMPTOMS INDICATED. IRON: SIDEROSIS LEAD: ANEMIA, URINARY DYSFUNCTION,METALLIC TASTE IN MOUTH, WEAKNESS, CONSTIPATION, NAUSEA, NERVOUS DISORDER. ZINC: CHROMOSOMAL A NOMALIES IN LEUKOCYTES REPORTED. ARTHRITIC, LAMENESS AND INFLAMMATION OF THE GASTROINTESTINAL TRACT REPORTED FROM ANIMAL STUDIES. TITANIUM: NO CHRONIC DEBILITATING SYMPTOMS INDICATED.

=====
===== First Aid Measures =====

First Aid:INGESTION: INGESTION OF SIGNIFICANT AMOUNTS OF ZINC/ALUMINUM ALLOY ARE UNLIKELY. SEEK MEDICAL HELP IF LARGE QUANTITIES OF PRODUCT ARE INGESTED. INHALATION:REMOVE FORM EXPOSURE TO DUST OR FUME IF PRESENT. SEEK MEDICAL HELP IF REQUIRED. SKIN CONTACT: FLUSH THOROUGHLY WITH WATER. EYE CONTACT: FLUSH WITH WATER FOR AT LEAST 15 MINUTES. SEEK MEDICAL HELP IF REQUIRED.

=====
Fire Fighting Measures
=====

Fire Fighting Procedures: NEVER USE WATER AS AN EXTINGUISHING AGENT AROUND MOLTEN METAL. WATER WILL REACT VIOLENTLY WITH ANY MOLTEN METAL. ****

Unusual Fire/Explosion Hazard: **** USE SELF-CONTAINED BREATHING APPARATUS FOR PROTECTION AGAINST DEGRADATION PRODUCTS AND FIRE FIGHTING TECHNIQUES OR AGENTS APPLICABLE TO SURROUNDING MATERIALS. SMALL CHIPS, FINE TURNINGS AND DUST MAY IGI TE READILY. DO NOT USE HALOGENATED EXTINGUISHING AGENTS ON SMALL CHIPS OR FINES. DUST CLOUDS MAY BE EXPLOSIVE. *****

=====
Handling and Storage
=====

Handling and Storage Precautions: TYPICALLY NO SPECIAL PROTECTION IS REQUIRED DURING USE OF THE PRODUCT BEYOND THAT REQUIRED FOR THE PROCESS OPERATION BEING EMPLOYED. WHERE DUST OR FUME LEVELS ARE GREATER THAN THOSE SPECIFIED IN SECTION ONE, NIOSH APPROVED RESPIRATORY PROTECTION SHOULD BE USED. **

Other Precautions: ** USE LOCAL EXHAUST VENTILATION FOR DUST/FUME. USE APPROVED GOGGLES FOR EYE PROTECTION. ***

=====
Exposure Controls/Personal Protection
=====

Supplemental Safety and Health

*** WET MATERIAL SHOULD NEVER BE CHARGED INTO A MOLTEN BATH. EYE PROTECTION SHOULD BE USED WHEN CUTTING, GRINDING, MACHINING OR BUFFING PRODUCT. EYE PROTECTION SHOULD ALSO BE USED WITH ANY OTHER PROCESS THAT GENERATES DUST, FUMES OR CHIPS. WASH HANDS THOROUGHLY AFTER USE, ESPECIALLY BEFORE EATING.

=====
Physical/Chemical Properties
=====

Melt/Freeze Pt: >376.7C, 710.F
M.P/F.P Text: 710-1200F
Spec Gravity: (H2O=1) 2.5-8.5

=====
Stability and Reactivity Data
=====

Stability Indicator/Materials to Avoid: YES
STRONG ACIDS, STRONG OXIDIZERS, STRONG ALKALIS (ESPECIALLY NAOH, KOH), FINELY DIVIDED METALS (ESPECIALLY ZINC, BARIUM, LITHIUM). SLOWLY CORRODES ALUMINUM, IRON, ZINC.

Stability Condition to Avoid: STABLE UNDER ORDINARY CONDITIONS OF USE OR STORAGE. SLOWLY DECOMPOSED BY LIGHT. DETERIORATES RAPIDLY IN WARM, MOIST CLIMATES.

Hazardous Decomposition Products: CARBON DIOXIDE & CARBON MONOXIDE MAY FORM WHEN HEATED TO DECOMPOSITION. HYDROGEN CHLORIDE GAS & PHOSGENE GAS MAY BE FORMED UPON HEATING. DECOMPOSES WITH MOISTURE TO YIELD TRICHLOROACETIC ACID & HCL

=====
Toxicological Information
=====

Toxicological Information: ***** THE ALLOY IS STABLE, NON-HAZARDOUS SOLID AT ROOM TEMPERATURE. MATERIAL MAY REACT WITH STRONG ACIDS OR ALKALINE MATERIALS. MATERIAL DOES NOT PRESENT A SIGNIFICANT HEALTH

HAZARD UNDER NORMAL HAND LING AND STORAGE.

=====
===== Ecological Information =====

Ecological:WHEN RELEASED INTO THE SOIL, THIS MATERIAL IS EXPECTED TO QUICKLY EVAPORATE. WHEN RELEASED INTO THE SOIL, THIS MATERIAL MAY LEACH INTO GROUNDWATER. WHEN RELEASED INTO THE SOIL, THIS MATERIAL MAY BIODE GRADE TO A MODERATE EXTENT. WHEN RELEASED TO WATER, THIS MATERIAL IS EXPECTED TO QUICKLY EVAPORATE. WHEN RELEASED INTO WATER, THIS MATERIAL IS NOT EXPECTED TO BIODEGRADE. THIS MATERIAL IS NOT EXPECTED TO SIGNIFIGANTLY BIOACCUMULATE. WHEN RELEASED TO THE AIR, THIS MATERIAL MAY BE MODERATELY DEGRADED BY REACTION WITH PHOTOCHEMICALLY PRODUCED HYDROXYL RADICALS. LC50/96-HR VALUES FOR FISH ARE BETWEEN 100-100 MG/L.

=====
===== MSDS Transport Information =====

Transport Information:AIR (ICAO) SHIPPING INFORMATION: SHIPPING NAME: TETRACHLOROETHYLENE, HAZARD CLASS: 6.1, UN NUMBER: UN1897, PACKING GROUP: III. DOT TRANSPORTATION INFORMATION: TETRACHLOROETHYLENE, HAZARD CLASS: 6.1, U N NUMBER: UN1897, PACKING GROUP: III.

=====
===== Regulatory Information =====

SARA Title III Information:TETRACHLOROETHYLENE IS A SARA 313 LISTED CHEMICAL
Federal Regulatory Information:CERCLA RQ: 100 LB, RCRA CODE: U210.
State Regulatory Information:PRODUCT CONTAINS CHEMICALS KNOWN TO STATE OF CALIFORNIA TO CAUSE CANCER.

=====
===== Other Information =====

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Material Safety Data Sheet

Amberlite XAD-4 Resin

ACC# 91919

Section 1 - Chemical Product and Company Identification

MSDS Name: Amberlite XAD-4 Resin

Catalog Numbers: AC202230000, AC202231000, AC202235000, AC9596581, NC9105118, XXAC20223-25KG, XXAC2022322K

Synonyms: None Known.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7732-18-5	Water	51-55	231-791-2
9003-69-4	Divinylbenzene polymer	45-49	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white.

Caution! May cause eye and skin irritation. May cause respiratory and digestive tract irritation. The toxicological properties of this material have not been fully investigated.

Target Organs: None.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation.

Ingestion: May cause irritation of the digestive tract. The toxicological properties of this substance have not been fully investigated.

Inhalation: May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not available.

Autoignition Temperature: 427 deg C (800.60 deg F)

Explosion Limits, Lower:Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 1; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up or absorb material, then place into a suitable clean, dry, closed container for disposal. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Store in a tightly closed container. Store at around 20°C. Store at around 20°C.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Water	none listed	none listed	none listed
Divinylbenzene polymer	none listed	none listed	none listed

OSHA Vacated PELs: Water: No OSHA Vacated PELs are listed for this chemical.

Divinylbenzene polymer: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Granules

Appearance: white

Odor: odorless

pH: 7-9

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate:Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point:Not available.

Decomposition Temperature:Not available.

Solubility: insoluble

Specific Gravity/Density:1.06

Molecular Formula:Mixture

Molecular Weight:Not available.

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Strong oxidants, strong oxidants.

Incompatibilities with Other Materials: Avoid contact with strong oxidizing agents, particularly concentrated nitric acid..

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 7732-18-5: ZC0110000

CAS# 9003-69-4 unlisted.

LD50/LC50:

CAS# 7732-18-5:

Oral, rat: LD50 = >90 mL/kg;

CAS# 9003-69-4:

Toxicity data for a compositionally similar material: , Oral LD50-rat: >5000 mg/kg., Dermal LD50-rabbit: >5000 mg/kg.

Carcinogenicity:

CAS# 7732-18-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 9003-69-4: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: No information available.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7732-18-5 is listed on the TSCA inventory.

CAS# 9003-69-4 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7732-18-5 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

CAS# 9003-69-4 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

S 37 Wear suitable gloves.

S 45 In case of accident or if you feel unwell, seek medical advice

immediately (show the label where possible).
S 28A After contact with skin, wash immediately with plenty of water

WGK (Water Danger/Protection)

CAS# 7732-18-5: No information available.

CAS# 9003-69-4: No information available.

Canada - DSL/NDSL

CAS# 7732-18-5 is listed on Canada's DSL List.

CAS# 9003-69-4 is listed on Canada's DSL List.

Canada - WHMIS

not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Amberlyst ® A-26 Ion-Exchange Resin

ACC# 17643

Section 1 - Chemical Product and Company Identification

MSDS Name: Amberlyst ® A-26 Ion-Exchange Resin

Catalog Numbers: AC202180000, AC202180010, AC202180050, AC202182500

Synonyms: Poly(caprolactone) Triol.

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
39280-09-6	Poly(caprolactone) Triol	100.0	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: clear, colorless viscous liquid.

Caution! May cause eye and skin irritation. May cause respiratory and digestive tract irritation. The toxicological properties of this material have not been fully investigated.

Target Organs: No data found.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation.

Ingestion: May cause irritation of the digestive tract. The toxicological properties of this substance have not been fully investigated.

Inhalation: May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: Get medical aid. As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Use water spray to keep fire-exposed containers cool.

Extinguishing Media: Use agent most appropriate to extinguish fire. Cool containers with flooding quantities of water until well after fire is out. Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: 226 deg C (438.80 deg F)

Autoignition Temperature: Not available.

Explosion Limits, Lower:Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Avoid runoff into storm sewers and ditches which lead to waterways. Clean

up spills immediately, observing precautions in the Protective Equipment section. Absorb spill using an absorbent, non-combustible material such as earth, sand, or vermiculite. Do not use combustible materials such as sawdust. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Keep container closed when not in use. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Poly(caprolactone) Triol	none listed	none listed	none listed

OSHA Vacated PELs: Poly(caprolactone) Triol: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Viscous liquid
Appearance: clear, colorless
Odor: None reported.
pH: Not available.
Vapor Pressure: Not available.
Vapor Density: Not available.
Evaporation Rate:Not available.
Viscosity: Not available.
Boiling Point: > 210 deg C
Freezing/Melting Point:-26 deg C
Decomposition Temperature:Not available.
Solubility: Not available.
Specific Gravity/Density:1.0700g/cm3
Molecular Formula:Not available.
Molecular Weight:Not available.

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Incompatible materials, excess heat, strong oxidants.
Incompatibilities with Other Materials: Oxidizing agents.
Hazardous Decomposition Products: Carbon monoxide, carbon monoxide, carbon dioxide.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 39280-09-6 unlisted.
LD50/LC50:
Not available.

Carcinogenicity:
CAS# 39280-09-6: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found
Teratogenicity: No information found
Reproductive Effects: No information found
Mutagenicity: No information found
Neurotoxicity: No information found
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 39280-09-6 is not listed on the TSCA inventory. It is for research and development use only.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 39280-09-6 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

S 37 Wear suitable gloves.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 28A After contact with skin, wash immediately with plenty of water

. WGK (Water Danger/Protection)

CAS# 39280-09-6: No information available.

Canada - DSL/NDSL

None of the chemicals in this product are listed on the DSL or NDSL list.

Canada - WHMIS

WHMIS: Not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Acid Black 1

ACC# 60360

Section 1 - Chemical Product and Company Identification

MSDS Name: Acid Black 1

Catalog Numbers: AC187300000, AC187300250, AC187301000, BP124-10

Synonyms: Amido Black 10B; Amido Schwarz; Aniline Blue Black; C.I. 20470; Naphthalene Black 10B; Naphthol Blue Black;

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
1064-48-8	Acid Black 1	96-100	213-903-1

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: black solid.

Warning! Causes eye, skin, and respiratory tract irritation.

Target Organs: Respiratory system, eyes, skin.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Causes skin irritation. May be harmful if absorbed through the skin.

Ingestion: May cause irritation of the digestive tract. May be harmful if swallowed.

Inhalation: Causes respiratory tract irritation. May be harmful if inhaled.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: Get medical aid immediately. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Dangerous fire hazard in the form of dust when exposed to heat or flame.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 2; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation. Do not let this chemical enter the environment.

Section 7 - Handling and Storage

Handling: Use with adequate ventilation. Minimize dust generation and accumulation.

Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation.

Storage: Store in a cool, dry place. Store in a tightly closed container.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Acid Black 1	none listed	none listed	none listed

OSHA Vacated PELs: Acid Black 1: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: dark brown - reddish - black

Odor: none reported

pH: 9.0 (1% aq. sol (25°C))

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: Not available.

Decomposition Temperature: 195 deg C

Solubility: 10 g/l (25°C)

Specific Gravity/Density: Not available.

Molecular Formula: C₂₂H₁₄N₆O₉S₂Na₂

Molecular Weight: 616.48

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, dust generation, heating to decomposition.

Incompatibilities with Other Materials: Strong oxidizing agents, reducing agents.

Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, oxides of sulfur, carbon dioxide, sodium monoxide.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 1064-48-8: QJ6196000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 1064-48-8: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found
Mutation in Microorganisms: Salmonella typhimurium = 50 ug/plate.

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information available.

Physical: No information available.

Other: Do not empty into drains.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR

Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	FLAMMABLE SOLIDS, ORGANIC, N.O.S.	Not Regulated.
Hazard Class:	4.1	
UN Number:	UN1325	
Packing Group:	II	

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 1064-48-8 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 1064-48-8 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XI

Risk Phrases:

R 36/37/38 Irritating to eyes, respiratory system and skin.

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 37/39 Wear suitable gloves and eye/face protection.

WGK (Water Danger/Protection)

CAS# 1064-48-8: 1

Canada - DSL/NDSL

CAS# 1064-48-8 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of Not controlled..

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Ammonium Persulfate, 98%

ACC# 95884

Section 1 - Chemical Product and Company Identification

MSDS Name: Ammonium Persulfate, 98%

Catalog Numbers: AC201530000, AC201530010

Synonyms: Ammonium Persulfate; Peroxydisulfuric Acid Diammonium Salt.

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7727-54-0	Ammonium persulfate	98.0	231-786-5

Hazard Symbols: XN O

Risk Phrases: 20/22 8

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid. **Danger!** Strong oxidizer. Contact with other material may cause a fire. May cause allergic skin reaction. Causes eye and skin irritation. Causes digestive and respiratory tract irritation. May be harmful if swallowed. Moisture sensitive.

Target Organs: None.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Causes skin irritation. May cause skin sensitization, an allergic reaction, which becomes evident upon re-exposure to this material.

Ingestion: Causes gastrointestinal irritation with nausea, vomiting and diarrhea. May be harmful if swallowed.

Inhalation: Causes respiratory tract irritation. Inhalation may be fatal as a result of spasm, inflammation, edema of the larynx and bronchi, chemical pneumonitis and pulmonary edema.

Chronic: Repeated or prolonged exposure may cause allergic reactions in sensitive individuals.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists. Wash clothing before reuse.

Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear. Do NOT use mouth-to-mouth resuscitation. If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Use water spray to keep fire-exposed containers cool. Oxidizer. Greatly increases the burning rate of combustible materials. This material in sufficient quantity and reduced particle size is capable of creating a dust explosion. May accelerate burning if involved in a fire. Containers may explode when heated.

Extinguishing Media: Do NOT get water inside containers. Cool containers with flooding quantities of water until well after fire is out. For small fires, do NOT use dry chemicals, carbon dioxide, halon or foams. USE WATER ONLY. For large fires, flood fire area with water from a distance.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 1; Instability: 1

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up,

then place into a suitable container for disposal. Provide ventilation. Do not get water inside containers.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid contact with clothing and other combustible materials. Avoid ingestion and inhalation. Do not allow contact with water. Wash clothing before reuse. Keep from contact with moist air and steam.

Storage: Do not store near combustible materials. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from metals. Keep away from reducing agents. Store protected from moisture.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Ammonium persulfate	none listed	none listed	none listed

OSHA Vacated PELs: Ammonium persulfate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white
Odor: odorless
pH: Not available.
Vapor Pressure: Negligible.
Vapor Density: Not available.
Evaporation Rate: Negligible.
Viscosity: Not available.
Boiling Point: Decomposes.
Freezing/Melting Point: 120 deg C
Decomposition Temperature: > 120 deg C
Solubility: 80g/100ml(25 C) (may decompose)
Specific Gravity/Density: 1.982 (water=1)
Molecular Formula: (NH₄)₂S₂O₈
Molecular Weight: 228.1846

Section 10 - Stability and Reactivity

Chemical Stability: Substance is shock sensitive and thermally unstable. Decomposes when heated. May decompose on exposure to moist air or water.

Conditions to Avoid: High temperatures, incompatible materials, ignition sources, moisture, metals, combustible materials, organic materials, reducing agents.

Incompatibilities with Other Materials: Moisture.

Hazardous Decomposition Products: Nitrogen oxides, oxides of sulfur, ammonia and/or derivatives, nitrogen.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 7727-54-0: SE0350000

LD50/LC50:

CAS# 7727-54-0:

Oral, rat: LD50 = 689 mg/kg; <BR.

Carcinogenicity:

CAS# 7727-54-0: Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA.

Epidemiology: No data available.

Teratogenicity: No data available.

Reproductive Effects: No data available.

Neurotoxicity: No data available.

Mutagenicity: No data available.

Other Studies: No data available.

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	IATA	RID/ADR	IMO	Canada TDG
Shipping Name:	AMMONIUM PERSULFATE				No information available.
Hazard Class:	5.1				
UN Number:	UN1444				
Packing Group:	III				

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7727-54-0 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

SARA

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

SARA Codes

CAS # 7727-54-0: acute, reactive.

Section 313

No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants. This material does not contain any Class 1 Ozone depletors. This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7727-54-0 can be found on the following state right to know lists: New Jersey.

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XN O

Risk Phrases:

R 20/22 Harmful by inhalation and if swallowed.

R 8 Contact with combustible material may cause fire.

Safety Phrases:

WGK (Water Danger/Protection)

CAS# 7727-54-0: 1

Canada - DSL/NDSL

CAS# 7727-54-0 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of C, D2B.

Canadian Ingredient Disclosure List

Exposure Limits

CAS# 7727-54-0: OEL-DENMARK: TWA 2 mg/m³ OEL-UNITED KINGDOM: TWA 1 mg

Material Safety Data Sheet

Ammonium Bromide

ACC# 01140

Section 1 - Chemical Product and Company Identification

MSDS Name: Ammonium Bromide

Catalog Numbers: A650-500, S79895

Synonyms: Hydrobromic Acid Monoammoniate.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
12124-97-9	Ammonium Bromide	100	235-183-8

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid.

Warning! Causes eye irritation. May cause respiratory and digestive tract irritation. May cause skin irritation. Air sensitive. Hygroscopic (absorbs moisture from the air).

Target Organs: No data found.

Potential Health Effects

Eye: Causes eye irritation.

Skin: May cause skin irritation.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea.

Inhalation: May cause respiratory tract irritation. Inhalation of bromides may cause irritation of the upper respiratory tract and lung tissue.

Chronic: Chronic ingestion may cause bromism characterized by disturbances of the central nervous system, skin and digestive tract.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists. Wash clothing before reuse.

Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear. Do NOT use mouth-to-mouth resuscitation.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: For small fires, use water spray, dry chemical, carbon dioxide or chemical foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation. Place under an inert atmosphere.

Section 7 - Handling and Storage

Handling: Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with skin and eyes. Keep container tightly closed. Avoid ingestion and inhalation. Handle under an inert atmosphere. Store protected from air.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Do not expose to air. Store protected from moisture. Store under an inert atmosphere.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Ammonium Bromide	none listed	none listed	none listed

OSHA Vacated PELs: Ammonium Bromide: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white

Odor: odorless

pH: Slightly acidic.

Vapor Pressure: 1 mm Hg @ 198C

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 846 deg F

Decomposition Temperature:Not available.

Solubility: 97% in water.

Specific Gravity/Density:2.4

Molecular Formula:NH₄Br

Molecular Weight:97.9387

Section 10 - Stability and Reactivity

Chemical Stability: Stable.

Conditions to Avoid: Incompatible materials, dust generation, moisture, exposure to air, excess heat, exposure to moist air or water.

Incompatibilities with Other Materials: Air, moisture, strong oxidizing agents.

Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, irritating and toxic fumes and gases, carbon dioxide, hydrogen bromide, ammonia and/or derivatives.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 12124-97-9: B09155000

LD50/LC50:

CAS# 12124-97-9:

Oral, mouse: LD50 = 2860 mg/kg;

Oral, rat: LD50 = 2700 mg/kg;

Oral, rat: LD50 =

Carcinogenicity:

CAS# 12124-97-9: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 12124-97-9 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

SARA Codes

CAS # 12124-97-9: immediate, delayed.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 12124-97-9 can be found on the following state right to know lists: Pennsylvania, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XI

Risk Phrases:

R 36 Irritating to eyes.

Safety Phrases:

WGK (Water Danger/Protection)

CAS# 12124-97-9: No information available.

Canada - DSL/NDSL

CAS# 12124-97-9 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Ammonium dichromate

ACC# 01210

Section 1 - Chemical Product and Company Identification

MSDS Name: Ammonium dichromate

Catalog Numbers: AC208810000, AC208811000, AC208815000, A644-100, A644-12, A644-212, A644-50, A644-500, S70636-1

Synonyms: Ammonium bichromate; Ammonium dichromate(VI).

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7789-09-5	Ammonium dichromate	99	232-143-1

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: orange to red crystals.

Danger! Risk of explosion by shock, friction, fire or other sources of ignition. Danger of serious damage to health by prolonged exposure through inhalation. May be fatal if inhaled or swallowed. Strong oxidizer. Contact with other material may cause a fire. Causes burns by all exposure routes. Harmful if absorbed through the skin. May cause allergic respiratory and skin reaction. May impair fertility. May cause harm to the unborn child. Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. Cancer hazard. May cause heritable genetic damage. May cause sensitization by inhalation and by skin contact.

Target Organs: Kidneys, liver, lungs, respiratory system, gastrointestinal system, eyes, reproductive system, skin.

Potential Health Effects

Eye: Causes eye burns. May cause blindness. May cause redness, pain, blurred vision and possible eye damage.

Skin: Harmful if absorbed through the skin. Causes skin burns. May cause skin sensitization, an allergic reaction, which becomes evident upon re-exposure to this material. May cause deep, penetrating ulcers of the skin. May cause dermatitis. 4-hour exposure to solid material showed no corrosion but well-defined erythema in 2/6 animals. Solid material moistened with physiological saline produced well-defined erythema and edema in all 6 animals, 2 of which showed necrotic focal sites. (Bayer)

Ingestion: May be fatal if swallowed. Poison by ingestion. Causes gastrointestinal tract burns. May cause circulatory system failure.

Inhalation: May be fatal if inhaled. May cause asthmatic attacks due to allergic sensitization of the respiratory tract. May cause ulceration and perforation of the nasal septum if inhaled in excessive quantities. Causes chemical burns to the respiratory tract.

Chronic: Prolonged or repeated inhalation may cause nosebleeds, nasal congestion, erosion of the teeth, perforation of the nasal septum, chest pain and bronchitis. Prolonged or repeated eye contact may cause conjunctivitis. Prolonged or repeated skin contact may cause sensitization dermatitis and possible destruction and/or ulceration. May cause liver and kidney damage. May cause cancer in humans. Possible risk of harm to the unborn child. May impair fertility.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Get medical aid immediately. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: Get medical aid immediately. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water. Call a poison control center.

Inhalation: If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask. POISON material. If inhaled, get medical aid immediately. Remove victim to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

Notes to Physician: Persons with asthma, allergies, and known sensitization to chromic acid or chromates may be at increased risk from exposure to this product. Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: Strong oxidizer. Contact with other material may cause fire. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Wear appropriate protective clothing to prevent contact with skin and eyes. Wear a self-contained breathing apparatus (SCBA) to prevent contact with thermal decomposition products. This material is an explosion hazard when exposed to heat,

mechanical shock, or friction. Explosive decomposition may occur under fire conditions.

Extinguishing Media: Use water only! Contact professional fire-fighters immediately. Cool containers with flooding quantities of water until well after fire is out. Do NOT use dry chemicals, CO₂, Halon or foams.

Flash Point: Not available.

Autoignition Temperature: 218 deg C (424.40 deg F)

Explosion Limits, Lower:Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 3; Flammability: 1; Instability: 2; Special Hazard: OX

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Remove all sources of ignition. Carefully scoop up and place into appropriate disposal container. Isolate area and deny entry. Provide ventilation. Do not use combustible materials such as paper towels to clean up spill. Keep combustibles (wood, paper, oil, etc.,) away from spilled material.

Section 7 - Handling and Storage

Handling: Use only in a well-ventilated area. Minimize dust generation and accumulation. Do not breathe dust, mist, or vapor. Do not get in eyes, on skin, or on clothing. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Keep container tightly closed. Avoid contact with clothing and other combustible materials. Do not ingest or inhale. Use only in a chemical fume hood. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames. Keep away from heat, sparks and flame.

Storage: Keep away from heat, sparks, and flame. Do not store near combustible materials. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Heat can cause thermal decomposition and pressure build-up inside containers. Material can explode if dry.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use only under a chemical fume hood. Use adequate general or local explosion-proof ventilation to keep airborne levels to acceptable levels.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Ammonium dichromate	0.05 mg/m ³ TWA (as Cr) (listed under Chromium (VI) compounds- water soluble).	0.001 mg/m ³ TWA (as Cr) (listed under Chromates). 15 mg/m ³ IDLH (as Cr(VI)) (listed under Chromates).	5 æg/m ³ TWA (listed under Chromium (VI) compounds). 0.1 mg/m ³ Ceiling (as CrO ₃ , applies to any operations or sectors for which the Hexavalent Chromium standard [29 CFR 1910.1026] is stayed or is otherwise not in effect) (listed under Chromates). 2.5 æg/m ³ Action Level (as Cr.); 5 æg/m ³ TWA (as Cr, Cancer hazard - See 29 CFR 1910.1026) (listed under Chromium (VI) compounds).

OSHA Vacated PELs: Ammonium dichromate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Crystals

Appearance: orange to red

Odor: odorless

pH: 3.45 for 10% soln.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 170 deg C

Decomposition Temperature: 170 deg C

Solubility: 360 g/l (20°C)

Specific Gravity/Density: 2.1500

Molecular Formula: (NH₄)₂Cr₂O₇

Molecular Weight: 252.06

Section 10 - Stability and Reactivity

Chemical Stability: Heating may cause an explosion.

Conditions to Avoid: Ignition sources, dust generation, excess heat, combustible materials, mechanical shock, friction.

Incompatibilities with Other Materials: Reducing agents, acids, bases, alcohols, hydrazine, sodium nitrate, ethylene glycol, carbides.

Hazardous Decomposition Products: Oxides of nitrogen, nitrogen gas, toxic chromium oxide fumes.

Hazardous Polymerization: Has not been reported

Section 11 - Toxicological Information

RTECS#:

CAS# 7789-09-5: HX7650000; HX7660000

LD50/LC50:

Not available.

Oral, rat: LD50 = 67.5 mg/kg; Inhalation, rat: LC50 = 0.156 mg/l/4H; Dermal, rabbit: LD50 = 1640 mg/kg (reported by Bayer)

Carcinogenicity:

CAS# 7789-09-5:

- **ACGIH:** A1 - Confirmed Human Carcinogen (listed as 'Chromium (VI) compounds-water soluble').
- **California:** carcinogen, initial date 2/27/87 (listed as Chromium (VI) compounds).
- **NTP:** Known carcinogen (listed as Chromium (VI) compounds).
- **IARC:** Group 1 carcinogen

Epidemiology: Certain hexavalent chromium compounds have been demonstrated to be carcinogenic on the basis of epidemiological investigations on workers and experimental studies in animals. Hexavalent chromium compounds have been said to also cause kidney damage in workers where absorption through damaged skin has occurred.

Teratogenicity: See actual entry in RTECS for complete information.

Reproductive Effects: May impair fertility.

Mutagenicity: DNA Repair: Salmonella typhimurium = 50 mmol/L.; DNA Repair: Bacillus subtilis = 50 mmol/L.

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: Fish: Mosquito Fish: LC50 = 136 mg/L; 96 Hr; Unspecified Fish: Mosquito Fish: LC50 = 212 mg/L; 48 Hr; Unspecified Chromium in soil can be transported to the atmosphere by way of aerosol formation. Chromium is also transported from soil through runoff and leaching of water. Runoff could remove both chromium ions and bulk precipitates of chromium, with final deposition on either a different land area or a water body. Chromium is present usually as Cr(III) in the soil and is characterized by its lack of mobility, except in cases where Cr(VI) is involved. Chromium(VI) of natural origin is rarely found.

Environmental: Most of the chromium in surface waters may be present in particulate form as sediment. Some of the particulate chromium would remain as suspended matter and ultimately be deposited in sediments. Trout can accumulate hexavalent chromium even at levels of 0.001 ppm. Barley absorbs chromium. Concentration factors for chromium: Marine plants 2000 times; freshwater and brown algae concentrate 100-500 times; Marine invertebrates 2000 times; Marine fish 400 times; and Freshwater fish 200 times.

Physical: No information available.

Other: Do not empty into drains.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	AMMONIUM DICHROMATE	AMMONIUM DICHROMATE
Hazard Class:	5.1	5.1
UN Number:	UN1439	UN1439
Packing Group:	II	II

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7789-09-5 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 7789-09-5: 10 lb final RQ; 4.54 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 7789-09-5: immediate, delayed, fire.

Section 313

This material contains Ammonium dichromate (listed as Chromium (VI) compounds), 99%, (CAS# 7789-09-5) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

CAS# 7789-09-5 is listed as a Hazardous Substance under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7789-09-5 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, (listed as Chromium (VI) compounds- water soluble), Minnesota, (listed as Chromium (VI) compounds), Massachusetts.

California Prop 65**The following statement(s) is(are) made in order to comply with the California Safe Drinking Water Act:**

WARNING: This product contains Ammonium dichromate, listed as 'Chromium (VI) compounds', a chemical known to the state of California to cause cancer.

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

T+ N E

Risk Phrases:

R 2 Risk of explosion by shock, friction, fire or other sources of ignition.

R 21 Harmful in contact with skin.

R 25 Toxic if swallowed.

R 26 Very toxic by inhalation.

R 34 Causes burns.

R 42/43 May cause sensitization by inhalation and skin contact.

R 45 May cause cancer.
R 46 May cause heritable genetic damage.
R 8 Contact with combustible material may cause fire.
R 48/23 Toxic : danger of serious damage to health by prolonged exposure through inhalation.
R 60 May impair fertility.
R 61 May cause harm to the unborn child.
R 50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Phrases:

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
S 53 Avoid exposure - obtain special instructions before use.
S 60 This material and its container must be disposed of as hazardous waste.
S 61 Avoid release to the environment. Refer to special instructions /safety data sheets.

WGK (Water Danger/Protection)

CAS# 7789-09-5: 3

Canada - DSL/NDSL

CAS# 7789-09-5 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of C, F, D1A, D2A.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 7789-09-5 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Ammonium Iodide, P.A.

ACC# 26312

Section 1 - Chemical Product and Company Identification

MSDS Name: Ammonium Iodide, P.A.

Catalog Numbers: AC206460000, AC206461000, AC206465000, A937

Synonyms: None known.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
12027-06-4	Ammonium iodide ((nh4)i)	ca. 100	234-717-7

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white to light yellow crystals.

Caution! May cause eye and skin irritation. May cause respiratory and digestive tract irritation. Air sensitive. Light sensitive. Hygroscopic (absorbs moisture from the air). May cause reproductive and fetal effects. The toxicological properties of this material have not been fully investigated.

Target Organs: Thyroid.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation.

Ingestion: May cause irritation of the digestive tract. The toxicological properties of this substance have not been fully investigated. Chronic ingestion of iodides during pregnancy

has resulted in fetal death, severe goiter, and cretinoid appearance of the newborn.

Inhalation: May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated.

Chronic: Chronic ingestion of iodides during pregnancy has resulted in fetal death, severe goiter, and cretinoid appearance of the newborn. Prolonged exposure to iodides may produce iodism in sensitive individuals. Symptoms could include skin rash, running nose and headache.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use water spray to cool fire-exposed containers. Use agent most appropriate to extinguish fire. Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: 405 deg C (761.00 deg F)

Autoignition Temperature: Not applicable.

Explosion Limits, Lower:Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 1; Instability: 1

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Clean up spills immediately, observing precautions in the Protective

Equipment section. Sweep up, then place into a suitable container for disposal. Avoid generating dusty conditions. Provide ventilation. Place under an inert atmosphere.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation. Store protected from light. Handle under an inert atmosphere. Store protected from air.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Do not expose to air. Store protected from moisture. Store protected from light. Store under an inert atmosphere.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Ammonium iodide (nh ₄)i	none listed	none listed	none listed

OSHA Vacated PELs: Ammonium iodide ((nh₄)i): No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Crystals
Appearance: white to light yellow
Odor: None reported.
pH: 4.5-6.5, 5% aq. soln
Vapor Pressure: Not available.
Vapor Density: Not available.
Evaporation Rate:Not available.
Viscosity: Not available.
Boiling Point: Not available.
Freezing/Melting Point:551 deg C
Decomposition Temperature:405 deg C
Solubility: 1g/0.6ml
Specific Gravity/Density:2.5140g/cm3
Molecular Formula:H4IN
Molecular Weight:144.94

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Incompatible materials, light, dust generation, exposure to air, excess heat, strong oxidants, exposure to moist air or water.
Incompatibilities with Other Materials: Air, moisture, strong oxidizing agents.
Hazardous Decomposition Products: Oxides of nitrogen, irritating and toxic fumes and gases, hydrogen iodide.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 12027-06-4 unlisted.
LD50/LC50:
Not available.

Carcinogenicity:
CAS# 12027-06-4: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found
Teratogenicity: No information found
Reproductive Effects: No information found
Mutagenicity: No information found
Neurotoxicity: No information found
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 12027-06-4 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 12027-06-4: immediate, delayed.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 12027-06-4 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

S 37 Wear suitable gloves.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 28A After contact with skin, wash immediately with plenty of water

WGK (Water Danger/Protection)

CAS# 12027-06-4: 1

Canada - DSL/NDSL

CAS# 12027-06-4 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 12027-06-4 is not listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Ammonium molybdate(VI) tetrahydrate

ACC# 01284

Section 1 - Chemical Product and Company Identification

MSDS Name: Ammonium molybdate(VI) tetrahydrate

Catalog Numbers: AC205850000, AC205851000, AC205855000, AC423310000, AC423310025, AC423310050, AC423311000, 42331-5000, A674-10, A674-3, A674-500, NC9419177, NC9709865

Synonyms: Ammonium heptamolybdate tetrahydrate; Ammonium heptamolybdate tetrahydrate; Ammonium paramolybdate tetrahydrate.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
12054-85-2	Ammonium molybdate(VI) tetrahydrate	99+	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white crystalline powder.

Warning! Causes eye, skin, and respiratory tract irritation. Harmful if swallowed. May cause blood abnormalities. May cause liver and kidney damage.

Target Organs: Blood, kidneys, liver, respiratory system, eyes, skin.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Causes skin irritation. May be harmful if absorbed through the skin.

Ingestion: Harmful if swallowed. May cause irritation of the digestive tract. May cause liver

and kidney damage. Molybdenum toxicity in ruminants is characterized by symptoms of copper deficiency.

Inhalation: Causes respiratory tract irritation. May be harmful if inhaled. Exposure may cause blood abnormalities. In an inhalation study, rats were administered 60 ug ammonium molybdate/ m3, 24 hours a day for 17 weeks. Changes in erythrocyte and leukocyte cell counts were observed.

Chronic: No information found. Rats were fed 25 or 50 ppm of ammonium molybdate in their food for 100 days, at which time they were killed and examined. Ammonium molybdate at 25 ppm had no effect on growth; at 50 ppm a slight decrease in the growth rate was observed. No deaths or significant effects on hemoglobin levels were observed at 25 or 50

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: Do not induce vomiting. Get medical aid immediately. Call a poison control center.

Inhalation: Remove from exposure and move to fresh air immediately. If breathing is difficult, give oxygen. Get medical aid. Do not use mouth-to-mouth resuscitation if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or chemical foam.

Flash Point: Not applicable.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container.

Avoid generating dusty conditions. Provide ventilation. Do not let this chemical enter the environment.

Section 7 - Handling and Storage

Handling: Minimize dust generation and accumulation. Do not get in eyes, on skin, or on clothing. Do not ingest or inhale. Use only with adequate ventilation.

Storage: Store in a cool, dry place. Store in a tightly closed container.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Ammonium molybdate(VI) tetrahydrate	0.5 mg/m ³ TWA (respirable fraction, as Mo) (listed under Molybdenum soluble compounds).	1000 mg/m ³ IDLH (as Mo) (listed under Molybdenum soluble compounds).	5 mg/m ³ TWA (as Mo) (listed under Molybdenum soluble compounds).
Ammonium molybdate(VI) anhydrous	0.5 mg/m ³ TWA (respirable fraction, as Mo) (listed under Molybdenum soluble compounds).	1000 mg/m ³ IDLH (as Mo) (listed under Molybdenum soluble compounds).	5 mg/m ³ TWA (as Mo) (listed under Molybdenum soluble compounds).

OSHA Vacated PELs: Ammonium molybdate(VI) tetrahydrate: No OSHA Vacated PELs are listed for this chemical. Ammonium molybdate(VI) anhydrous: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Crystalline powder
Appearance: white
Odor: none reported
pH: 5.0 - 5.5 (5% aq.sol.)
Vapor Pressure: Not applicable.
Vapor Density: Not available.
Evaporation Rate:Not applicable.
Viscosity: Not applicable.
Boiling Point: decomposes
Freezing/Melting Point:190 deg C
Decomposition Temperature:Not available.
Solubility: Soluble.
Specific Gravity/Density:2.490
Molecular Formula:H₂₄Mo₇N₆O₂₄.4H₂O
Molecular Weight:1235.86

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Incompatible materials, dust generation, excess heat.
Incompatibilities with Other Materials: Strong acids, strong oxidizing agents.
Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, carbon dioxide, ammonia and/or derivatives, oxides of molybdenum.
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 12054-85-2 unlisted.

CAS# 12027-67-7: QA5076000

LD50/LC50:

Not available.

Not available.

Oral median lethal dose for daily repeated doses was found to be 333 mg Mo/kg/day (up to 232 days) for ammonium molybdate. This is not an acute oral LD50 value, which is a dose administered once.

Carcinogenicity:

CAS# 12054-85-2:

- **ACGIH:** A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans (listed as 'Molybdenum soluble compounds').
- **California:** Not listed.

- **NTP:** Not listed.
- **IARC:** Not listed.

CAS# 12027-67-7:

- **ACGIH:** A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans (listed as 'Molybdenum soluble compounds').
- **California:** Not listed.
- **NTP:** Not listed.
- **IARC:** Not listed.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: Mutation in microorganisms: See actual entry in RTECS for complete information.

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information available.

Physical: No information available.

Other: Do not empty into drains.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not Regulated	Not Regulated
Hazard Class:		
UN Number:		

Packing Group:		
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Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 12054-85-2 is not on the TSCA Inventory because it is a hydrate. It is considered to be listed if the CAS number for the anhydrous form is on the inventory (40CFR720.3(u)(2)).

CAS# 12027-67-7 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 12054-85-2: immediate, delayed.

CAS # 12027-67-7: immediate, delayed.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 12054-85-2 can be found on the following state right to know lists: California, (listed as Molybdenum compounds, n.o.s.), Minnesota, (listed as Molybdenum soluble compounds).

CAS# 12027-67-7 can be found on the following state right to know lists: Minnesota, (listed as Molybdenum soluble compounds).

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XN

Risk Phrases:

R 22 Harmful if swallowed.

R 36/37/38 Irritating to eyes, respiratory system and skin.

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 37/39 Wear suitable gloves and eye/face protection.

WGK (Water Danger/Protection)

CAS# 12054-85-2: 1

CAS# 12027-67-7: 1

Canada - DSL/NDSL

CAS# 12027-67-7 is listed on Canada's DSL List.

Canada - WHMIS

not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 12054-85-2 (listed as Molybdenum compounds, n.o.s.) is listed on the Canadian Ingredient Disclosure List.

CAS# 12027-67-7 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Ammonium nitrate

ACC# 01290

Section 1 - Chemical Product and Company Identification

MSDS Name: Ammonium nitrate

Catalog Numbers: AC205860000, AC205860010, AC205861000, AC205865000, AC423350000, AC423350010, AC423350250, A676-212, A676-500, S75244

Synonyms: Nitric acid, ammonium salt; Norway saltpeter.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
6484-52-2	Ammonium nitrate	> 98	229-347-8

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white to gray to brown solid.

Danger! Strong oxidizer. Contact with other material may cause a fire. Causes eye, skin, and respiratory tract irritation. May cause methemoglobinemia. Hygroscopic (absorbs moisture from the air). Ammonium nitrate when contaminated with oil, charcoal, or other organic materials should be considered an explosive capable of detonation by combustion or by explosion of adjacent explosive materials.

Target Organs: Blood, respiratory system, eyes, skin.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Causes skin irritation.

Ingestion: Ingestion of large amounts may cause gastrointestinal irritation. Methemoglobinemia is characterized by dizziness, drowsiness, headache, shortness of breath, cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood), rapid heart rate and chocolate-brown colored blood.

Inhalation: Causes respiratory tract irritation. May cause methemoglobinemia, cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood), convulsions, tachycardia, dyspnea (labored breathing), and death. Methemoglobinemia is characterized by dizziness, drowsiness, headache, shortness of breath, cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood), rapid heart rate and chocolate-brown blood. Inhalation can cause systemic acidosis and methemoglobinemia.

Chronic: May cause methemoglobinemia, which is characterized by chocolate-brown colored blood, headache, weakness, dizziness, breath shortness, cyanosis (bluish skin due to deficient oxygenation of blood), rapid heart rate, unconsciousness and possible death. May cause digestive tract disturbances.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Absorption of this product into the body may cause cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood). Moderate degrees of cyanosis need to be treated only by supportive measures: bed rest and oxygen inhalation. For methemoglobinemia, administer oxygen alone or with Methylene Blue depending on the methemoglobin concentration in the blood. Cleansing of the entire contaminated area of the body is of utmost importance.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Strong oxidizer. Contact with other material may cause fire. May explode under confinement and high temperatures, especially if contaminated.

Extinguishing Media: Use water spray to cool fire-exposed containers. Use flooding quantities of water as spray.

Flash Point: Not available.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 2; Special Hazard: OX

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation. Keep combustibles (wood, paper, oil, etc.,) away from spilled material.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep away from heat, sparks and flame. Keep from contact with clothing and other combustible materials. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames. Avoid breathing dust. Inform laundry personnel of contaminant's hazards. Avoid localized heating of ammonium nitrate, potentially leading to development of high temperature areas. Ensure that ammonium nitrate is not exposed to strong shock waves from explosives. Avoid low pH (acidic) conditions.

Storage: Do not store near combustible materials. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from acids. Keep away from reducing agents. Avoid storage on wood floors.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Ammonium nitrate	none listed	none listed	none listed

OSHA Vacated PELs: Ammonium nitrate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: solid

Appearance: white to gray to brown

Odor: odorless

pH: 5.4 (0.1 M solution)

Vapor Pressure: Negligible.

Vapor Density: Not available.

Evaporation Rate: Negligible.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 169 deg C

Decomposition Temperature: 210 deg C

Solubility: Soluble.

Specific Gravity/Density: 1.725 @ 25°C

Molecular Formula: NH₄NO₃

Molecular Weight: 80.04

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions. Risk of explosion if heated under confinement. Deliquescent (tending to absorb atmospheric water vapor and become liquid).

Conditions to Avoid: Dust generation, contamination, heating in a confined space.

Incompatibilities with Other Materials: Strong reducing agents, strong acids, finely powdered metals, organic matter, chlorides, combustible materials.

Hazardous Decomposition Products: Oxides of nitrogen.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 6484-52-2: BR9050000

LD50/LC50:

CAS# 6484-52-2:

Oral, rat: LD50 = 2217 mg/kg;

Carcinogenicity:

CAS# 6484-52-2: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No data available.

Teratogenicity: No data available.

Reproductive Effects: No data available.

Mutagenicity: No data available.

Neurotoxicity: No data available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	AMMONIUM NITRATE	AMMONIUM NITRATE
Hazard Class:	5.1	5.1
UN Number:	UN1942	UN1942
Packing Group:	III	III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 6484-52-2 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 6484-52-2: immediate, fire, reactive.

Section 313

This material contains Ammonium nitrate (listed as Water Dissociable Nitrate Compounds), > 98%, (CAS# 6484-52-2) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 6484-52-2 can be found on the following state right to know lists: New Jersey, Pennsylvania, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XI O

Risk Phrases:

R 36/37/38 Irritating to eyes, respiratory system and skin.

R 8 Contact with combustible material may cause fire.

R 9 Explosive when mixed with combustible material.

Safety Phrases:

S 17 Keep away from combustible material.

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 37/39 Wear suitable gloves and eye/face protection.

WGK (Water Danger/Protection)

CAS# 6484-52-2: 1

Canada - DSL/NDSL

CAS# 6484-52-2 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of C, D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 6484-52-2 is not listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Ammonium oxalate monohydrate

ACC# 06510

Section 1 - Chemical Product and Company Identification

MSDS Name: Ammonium oxalate monohydrate

Catalog Numbers: AC206270000, AC206270010, AC206275000, AC423360000, AC423360050, AC423365000, S75031, S75032, S79900, S799001, A679-500

Synonyms: Diammonium oxalate, monohydrate; Ethanedioic acid, diammonium salt monohydrate; Oxalic acid, diammonium salt monohydrate.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
6009-70-7	Ammonium oxalate monohydrate	> 99	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white crystalline powder.

Warning! Harmful if swallowed. Causes eye, skin, and respiratory tract irritation. May cause kidney damage.

Target Organs: Kidneys, heart, eyes, skin, brain, nerves, mucous membranes.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Oxalate is an irritant and may cause dermatitis. Skin lesions begin with epithelial cracking and the formation of slow-healing ulcers. The fingers may appear cyanotic.

Ingestion: Ulcerations of the mouth, vomiting of blood, and rapid appearance of shock,

convulsions, twitching, tetany, and cardiovascular collapse may occur following ingestion of oxalic acid or its soluble salts. Systemic effects may be due to formation of calcium oxalate which is insoluble at physiological pH and can be deposited in the brain and kidney tubules. Resultant hypocalcemia might disturb the function of the heart and nerves. Mean lethal dose for oxalates in adults is estimated at 10 - 30 grams (143 - 428 mg/kg).

Inhalation: Inhalation of oxalic acid dust or vapor produces irritation of the respiratory tract, protein in the urine, nosebleed, ulceration of the mucous membranes, headache, nervousness, cough, vomiting, emaciation, back pain (due to kidney injury), and weakness.

Chronic: Inhalation of oxalic acid dust or mist over a long period of time might result in weight loss and respiratory tract inflammation. Rats administered oxalic acid at 2.5 and 5% in the diet for 70 days developed depressed thyroid function and weight loss. A study of railroad car cleaners in Norway who were heavily exposed to oxalic acid solutions and vapors revealed a 53% prevalence of urolithiasis (the formation of urinary stones), compared to a rate of 12% among unexposed workers from the same company.

Section 4 - First Aid Measures

Eyes: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical aid.

Skin: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid immediately. Wash clothing before reuse.

Ingestion: If swallowed, do NOT induce vomiting. Get medical aid immediately. If victim is fully conscious, give a cupful of water. Never give anything by mouth to an unconscious person.

Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Antidote: Intravenous administration of calcium gluconate or calcium chloride may be required if hypocalcemia or hypocalcemic tetany occur.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Use water spray to keep fire-exposed containers cool.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 1; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid breathing dust.
Storage: Store in a cool, dry, well-ventilated area away from incompatible substances. Oxalates slowly corrode steel.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Ammonium oxalate monohydrate	none listed	none listed	none listed
Ammonium oxalate anhydrous	none listed	none listed	none listed

OSHA Vacated PELs: Ammonium oxalate monohydrate: No OSHA Vacated PELs are listed for this chemical. Ammonium oxalate anhydrous: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or

European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Crystalline powder

Appearance: white

Odor: odorless

pH: 6.4 (0.1M soln)

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Evaporation Rate:Not applicable.

Viscosity: Not available.

Boiling Point: Decomposes.

Freezing/Melting Point:70 deg C

Decomposition Temperature:70 deg C

Solubility: Soluble.

Specific Gravity/Density:1.5

Molecular Formula:C₂H₈N₂O₄.H₂O

Molecular Weight:142.11

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Dust generation, excess heat, Oxalates slowly corrode steel..

Incompatibilities with Other Materials: Strong oxidizing agents.

Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, carbon dioxide, formic acid, ammonia.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 6009-70-7 unlisted.

CAS# 1113-38-8: RO2750000

LD50/LC50:

Not available.

Not available.

CAS# 1113-38-8; Rat TDLo Oral: 9 mL/kg/3D continuous. Published data indicated liver changes and biochemical effects. Mean lethal dose for oxalates in adults is estimated at 10-30 grams (143-428 mg/kg).

Carcinogenicity:

CAS# 6009-70-7: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 1113-38-8: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: A study of railroad car cleaners in Norway who were heavily exposed to oxalic acid solutions and vapors revealed a 53% prevalence of urolithiasis (the formation of urinary stones), compared to a rate of 12% among unexposed workers from the same company.**Teratogenicity:** No information available.**Reproductive Effects:** Oxalic acid caused kidney damage in fetal sheep and rats and disturbed the estrus cycle in rats. Increased sperm abnormalities were seen in the second generation of mice administered 0.2% oxalic acid in the drinking water.**Mutagenicity:** No information available.**Neurotoxicity:** No information available.**Other Studies:**

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.**RCRA U-Series:** None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	TOXIC SOLIDS, ORGANIC, N.O.S.	TOXIC SOLID ORGANIC NOS (AMMONIUM OXALATE MONOHYDRATE)
Hazard Class:	6.1	6.1
UN Number:	UN2811	UN2811
Packing Group:	III	III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 6009-70-7 is not on the TSCA Inventory because it is a hydrate. It is considered to be listed if the CAS number for the anhydrous form is on the inventory (40CFR720.3(u)(2)).

CAS# 1113-38-8 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 6009-70-7: 5000 lb final RQ (listed under Ammonium oxalate); 2270 kg final RQ (listed under

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

SARA Codes

CAS # 6009-70-7: immediate, delayed.

CAS # 1113-38-8: immediate, delayed.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

CAS# 6009-70-7 is listed as a Hazardous Substance under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 6009-70-7 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Massachusetts.

CAS# 1113-38-8 can be found on the following state right to know lists: New Jersey.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XN

Risk Phrases:

R 21/22 Harmful in contact with skin and if swallowed.

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 6009-70-7: 1

CAS# 1113-38-8: No information available.

Canada - DSL/NDSL

CAS# 1113-38-8 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D1B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

**SIGMA CHEMICAL COMPANY -- 09910 AMMONIUM PERCHLORATE FINE CRYST --
6850-00F056548**

=====
===== Product Identification =====

Product ID:09910 AMMONIUM PERCHLORATE FINE CRYST
MSDS Date:08/01/1995
FSC:6850
NIIN:00F056548
MSDS Number: CHNDZ
=== Responsible Party ===
Company Name:SIGMA CHEMICAL COMPANY
Address:3050 SPRUCE ST
Box:14508
City:SAINT LOUIS
State:MO
ZIP:63178-5000
Country:US
Info Phone Num:314-771-5765/800-325-3010
Emergency Phone Num:314-771-5765/800-325-3010
CAGE:21076

==== Contractor Identification ====

Company Name:ALDRICH CHEMICAL CO INC
Address:1001 WEST ST PAUL AVE
Box:355
City:MILWAUKEE
State:WI
ZIP:53233
Country:US
Phone:414-273-3850
CAGE:60928

Company Name:FLUKA CHEMICAL CORP
Address:1001 WEST ST PAUL
Box:City:MILWAUKEE
State:WI
ZIP:53233
Country:US
Phone:414-273-3850
CAGE:63181

Company Name:SIGMA CHEMICAL COMPANY
Address:3050 SPRUCE ST
Box:14508
City:ST LOUIS
State:MO
ZIP:63178
Country:US
Phone:314-771-5765
CAGE:21076

=====
===== Composition/Information on Ingredients =====

Ingred Name:AMMONIUM PERCHLORATE
CAS:7790-98-9
RTECS #:SC7520000

=====
===== Hazards Identification =====

LD50 LC50 Mixture:ORAL LD50(RAT): 4200 MG/KG
Routes of Entry: Inhalation:YES Skin:YES Ingestion:YES
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:HARMFUL IF INGESTED, INHALED/ABSORBED
THROUGH SKIN. EYES/SKIN: IRRITATION. INHALATION: IRRITATING TO
MUCOUS MEMBRANES & UPPER RESPIRATORY TRACT.
Explanation of Carcinogenicity:NONE
Effects of Overexposure:IRRITATION.

=====
===== First Aid Measures =====

First Aid:EYES/SKIN: FLUSH W/COPIOUS AMOUNTS OF WATER FOR 15 MINS.
INHALATION: REMOVE TO FRESH AIR. GIVE CPR/OXYGEN IF NEEDED.
INGESTION: WASH OUT MOUTH W/WATER IF CONSCIOUS. OBTAIN MEDICAL
ATTENTION IN ALL CAS ES.

=====
===== Fire Fighting Measures =====

Extinguishing Media:WATER SPRAY.
Fire Fighting Procedures:WEAR SCBA & PROTECTIVE CLOTHING. USE WATER
SPRAY TO COOL FIRE-EXPOSED CONTAINERS.
Unusual Fire/Explosion Hazard:MAY EXPLODE WHEN HEATED. CONTACT W/OTHER
MATERIAL MAY CAUSE FIRE. EMITS TOXIC FUMES UNDER FIRE CONDITIONS.

=====
===== Accidental Release Measures =====

Spill Release Procedures:EVACUATE AREA. WEAR SCBA, RUBBER BOOTS & HEAVY
RUBBER GLOVES. COVER W/DRY LIME/SODA ASH, PICKUP, KEEP IN A CLOSED
CONTAINER & HOLD FOR WASTE DISPOSAL. VENTILATE AREA & WASH SITE
AFTER MATERIAL PICKUP IS COMPLETE.

=====
===== Handling and Storage =====

Handling and Storage Precautions:STORE IN A COOL DRY PLACE. KEEP AWAY
FROM COMBUSTIBLE MATERIALS/HEAT/SPARKS & OPEN FLAME. KEEP TIGHTLY
CLOSED.
Other Precautions:AVOID PROLONGED/REPEATED EXPOSURE. DON'T GET IN EYES,
SKIN/CLOTHING. DON'T BREATHE DUST.

=====
===== Exposure Controls/Personal Protection =====

Respiratory Protection:WEAR APPROPRIATE NIOSH/MSHA APPROVED RESPIRATOR.
Ventilation:CHEMICAL FUME HOOD.
Protective Gloves:CHEMICAL RESISTANT
Eye Protection:SAFETY GOGGLES
Other Protective Equipment:PROTECTIVE CLOTHING, SAFETY SHOWER & EYE
BATH.
Work Hygienic Practices:DISCARD CONTAMINATED CLOTHING & SHOES. WASH
THOROUGHLY AFTER HANDLING.
Supplemental Safety and Health

=====
===== Physical/Chemical Properties =====

Spec Gravity:1.95
Appearance and Odor:WHITE POWDER

=====
===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid: YES
STRONG REDUCING AGENTS, STRONG ACIDS, STRONG OXIDIZERS.
Stability Condition to Avoid: HEAT, SPARKS, OPEN FLAMES.
Hazardous Decomposition Products: COMBUSTION: AMMONIA.

===== Disposal Considerations =====

Waste Disposal Methods: CAUTIOUSLY ADD A LARGE STIRRED EXCESS OF WATER.
ADJUST THE PH TO NEUTRAL, SEPARATE INSOLUBLE SOLIDS/LIQUIDS &
PACKAGE FOR HAZARDOUS WASTE DISPOSAL, IAW/FEDERAL, STATE & LOCAL
REGULATIONS. FLUSH THE AQUEOUS SOLUTION DOWN THE DRAIN W/PLENTRY OF
WATER.

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assume responsibility for the suitability of this information to their
particular situation.

Material Safety Data Sheet

Ammonium phosphate, dibasic

ACC# 01350

Section 1 - Chemical Product and Company Identification

MSDS Name: Ammonium phosphate, dibasic

Catalog Numbers: AC201820000, AC201822500, AC201825000, AC423370000, AC423370050, 42337-5000, A686-500, A686500LC, BP361-500

Synonyms: Diammonium hydrogen phosphate; DAP.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7783-28-0	Ammonium phosphate, dibasic	99+	231-987-8

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid.

Warning! Causes eye, skin, and respiratory tract irritation.

Target Organs: Respiratory system, eyes, skin.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Causes skin irritation. May be harmful if absorbed through the skin.

Ingestion: May cause irritation of the digestive tract. May be harmful if swallowed.

Inhalation: Causes respiratory tract irritation. May be harmful if inhaled.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: Do not induce vomiting. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Substance is noncombustible.

Extinguishing Media: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 1

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation. Do not let this chemical enter the environment.

Section 7 - Handling and Storage

Handling: Use with adequate ventilation. Minimize dust generation and accumulation. Do not get in eyes, on skin, or on clothing. Do not ingest or inhale.

Storage: Store in a cool, dry place. Store in a tightly closed container.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Ammonium phosphate, dibasic	none listed	none listed	none listed

OSHA Vacated PELs: Ammonium phosphate, dibasic: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white

Odor: Not available.

pH: 7.9 - 8.3 (5% aq.sol. 20°C)

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not applicable.

Boiling Point: Not available.

Freezing/Melting Point: Not available.

Decomposition Temperature: 100 deg C

Solubility: 58 g/100mL (20°C)

Specific Gravity/Density: 1.619

Molecular Formula: (NH₄)₂HPO₄

Molecular Weight: 132.06

Section 10 - Stability and Reactivity

Chemical Stability: Air sensitive.

Conditions to Avoid: Incompatible materials, dust generation, exposure to air, excess heat.

Incompatibilities with Other Materials: Strong oxidizing agents, strong acids, sodium hypochlorite.

Hazardous Decomposition Products: Nitrogen oxides, oxides of phosphorus, ammonia.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 7783-28-0 unlisted.

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 7783-28-0: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information available.

Physical: No information available.

Other: Do not empty into drains.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR

Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated	Not Regulated
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7783-28-0 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

SARA Codes

CAS # 7783-28-0: immediate.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7783-28-0 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XI

Risk Phrases:

R 36/37/38 Irritating to eyes, respiratory system and skin.

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 37/39 Wear suitable gloves and eye/face protection.

WGK (Water Danger/Protection)

CAS# 7783-28-0: 1

Canada - DSL/NDSL

CAS# 7783-28-0 is listed on Canada's DSL List.

Canada - WHMIS

not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 7783-28-0 is not listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Ammonium sulfate

ACC# 01410

Section 1 - Chemical Product and Company Identification

MSDS Name: Ammonium sulfate

Catalog Numbers: AC205870000, AC205870010, AC205872500, AC423400000, AC423400030, AC423400050, AC423400250, 42340-0010, 42340-5000, A701-3, A701-50, A702-10, A702-3, A702-500, A938-500, BP212-212, BP212R-1, NC9155259, NC9179991, NC9273346, NC9685224, S71915ACS

Synonyms: Diammonium sulfate; Sulfuric acid, diammonium salt.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7783-20-2	Ammonium sulfate	99+	231-984-1

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: colorless crystals.

Warning! Causes eye, skin, and respiratory tract irritation.

Target Organs: Respiratory system, eyes, skin.

Potential Health Effects

Eye: Causes eye irritation. Causes redness and pain.

Skin: Causes skin irritation. May be harmful if absorbed through the skin. May cause reddening of the skin.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. May be

harmful if swallowed.

Inhalation: Causes respiratory tract irritation. May be harmful if inhaled. May cause respiratory difficulty and coughing. May contribute to asthma attacks or clearance problems in persons with these pre-existing pulmonary diseases

Chronic: Prolonged or repeated skin contact may cause dermatitis. Prolonged or repeated exposure may cause permanent eye damage. Chronic exposure may cause lung damage. Systemic ammonia poisoning is possible if sufficient absorption occurs.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: Do not induce vomiting. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Substance is noncombustible. Decomposes at high temperatures, resulting in toxic and corrosive products.

Extinguishing Media: Substance is nonflammable; use agent most appropriate to extinguish surrounding fire.

Flash Point: Not applicable.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 1

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation. Do not let this chemical enter the environment.

Section 7 - Handling and Storage

Handling: Use with adequate ventilation. Minimize dust generation and accumulation. Do not get in eyes, on skin, or on clothing. Do not ingest or inhale.

Storage: Store in a cool, dry place. Store in a tightly closed container.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Ammonium sulfate	none listed	none listed	none listed

OSHA Vacated PELs: Ammonium sulfate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Crystals

Appearance: colorless

Odor: odorless

pH: 5-6 (5% aq.sol. @ 20°C)

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Negligible

Viscosity: Not applicable.

Boiling Point: Not applicable.

Freezing/Melting Point:280 deg C
Decomposition Temperature:Not available.
Solubility: 77g/100mL @ 25°C
Specific Gravity/Density:1.760
Molecular Formula:(NH4)2SO4
Molecular Weight:132.13

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Incompatible materials, dust generation, heating to decomposition.
Incompatibilities with Other Materials: Chlorates, nitrites, oxidizing agents, bases, alkali metals.
Hazardous Decomposition Products: Oxides of sulfur, nitrogen oxides (NOx) and ammonia (NH3).
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:
CAS# 7783-20-2: BS4500000
LD50/LC50:
CAS# 7783-20-2:
Oral, mouse: LD50 = 640 mg/kg;
Oral, mouse: LD50 = 4280 mg/kg;
Oral, rat: LD50 = 2840 mg/kg;
Oral, rat: LD50 = 4540 mg/kg;

Carcinogenicity:
CAS# 7783-20-2: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found
Teratogenicity: No information found
Reproductive Effects: No information found
Mutagenicity: No information found
Neurotoxicity: No information found
Other Studies:

Section 12 - Ecological Information

Ecotoxicity: Water flea Daphnia: LC50 = 423 mg/L; 25 Hr; Unspecified No data available.

Environmental: No information available.

Physical: No information available.

Other: Do not empty into drains.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated	Not Regulated
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7783-20-2 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 7783-20-2: immediate.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7783-20-2 can be found on the following state right to know lists: New Jersey, Pennsylvania, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XI

Risk Phrases:

R 36/37/38 Irritating to eyes, respiratory system and skin.

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 37/39 Wear suitable gloves and eye/face protection.

WGK (Water Danger/Protection)

CAS# 7783-20-2: 1

Canada - DSL/NDSL

CAS# 7783-20-2 is listed on Canada's DSL List.

Canada - WHMIS

not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 7783-20-2 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Aniline Blue

ACC# 60030

Section 1 - Chemical Product and Company Identification

MSDS Name: Aniline Blue

Catalog Numbers: AC229660000, AC229660250, AC229661000, AC401180000, 40118-0250, A967-25

Synonyms: Acid Blue B; Calcocid Blue B; Marine Blue V; China Blue; C.I. 42755; C.I. Acid Blue 22; Ink Blue A; Soluble Blue B; Benzenesulfonic acid,

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
28631-66-5	Aniline blue	100	249-113-9

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: dark purple solid.

Warning! Causes eye, skin, and respiratory tract irritation. The toxicological properties of this material have not been fully investigated.

Target Organs: Respiratory system, eyes, skin.

Potential Health Effects

Eye: Causes eye irritation. This product contains an anionic dye. Similar dyes have not caused injury to the cornea or conjunctiva in documented exposure cases with human or rabbit eyes.

Skin: Causes skin irritation. May be absorbed through the skin in harmful amounts.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. May be harmful if swallowed.

Inhalation: Causes respiratory tract irritation. May be harmful if inhaled.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. This material in sufficient quantity and reduced particle size is capable of creating a dust explosion.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container.

Clean up spills immediately, observing precautions in the Protective Equipment section.

Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid breathing dust.

Storage: Store in a cool, dry, well-ventilated area away from incompatible substances. Keep containers tightly closed.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Aniline blue	none listed	none listed	none listed

OSHA Vacated PELs: Aniline blue: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: dark purple

Odor: odorless

pH: Not available.

Vapor Pressure: Negligible.

Vapor Density: Not available.

Evaporation Rate: Negligible.

Viscosity: Not available.

Boiling Point: Not available.
Freezing/Melting Point:Not available.
Decomposition Temperature:Not available.
Solubility: Soluble.
Specific Gravity/Density:Not available.
Molecular Formula:C₃₂H₂₅N₃O₉S₃Na₂
Molecular Weight:737.76

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Incompatible materials, dust generation.
Incompatibilities with Other Materials: Not available.
Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, oxides of sulfur, carbon dioxide.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 28631-66-5: DB4958000
LD50/LC50:
Not available.

Carcinogenicity:
CAS# 28631-66-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found
Teratogenicity: No information found
Reproductive Effects: No information found
Mutagenicity: No information found
Neurotoxicity: No information found
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not Regulated	Not Regulated
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 28631-66-5 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 28631-66-5: immediate.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 28631-66-5 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XI

Risk Phrases:

R 36/37/38 Irritating to eyes, respiratory system and skin.

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 37/39 Wear suitable gloves and eye/face protection.

WGK (Water Danger/Protection)

CAS# 28631-66-5: No information available.

Canada - DSL/NDSL

CAS# 28631-66-5 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of Not controlled..

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

POST APPLE SCIENTIFIC INC -- CHARCOAL ANIMAL POWDER,89440,GPL 495 C 99 --
6810-00D007574

=====
Product Identification
=====

Product ID:CHARCOAL ANIMAL POWDER,89440,GPL 495 C 99
MSDS Date:06/01/1994
FSC:6810
NIIN:00D007574
MSDS Number: CGMSQ
=== Responsible Party ===
Company Name:POST APPLE SCIENTIFIC INC
Address:8893 GULF RD
City:NORTH EAST
State:PA
ZIP:16428-4298
Country:US
Info Phone Num:814-725-3330/FAX:814-725-8103
Emergency Phone Num:814-725-3330/800-424-9300 (CHEMTREC)
CAGE:EO236

==== Contractor Identification ====

Company Name:CHEM SCIENTIFIC INC
Address:1250 WASHINGTON ST
Box:City:NORWOOD
State:MA
ZIP:02062
Country:US
Phone:781-440-0900
CAGE:0X801
Company Name:POST APPLE SCIENTIFIC INC
Address:8893 GULF ROAD
Box:UNKNOW
City:NORTH EAST
State:PA
ZIP:16428-4298
Country:US
Phone:814-725-3330
CAGE:06JC6
Company Name:POST APPLE SCIENTIFIC INC FORMERLY GORDON POST LAB
Address:8893 GULF ROAD
Box:City:NORTH EAST
State:PA
ZIP:16428
Country:US
Phone:814-725-3330 FAX: 814-725-8103
CAGE:EO236

=====
Composition/Information on Ingredients
=====

Ingred Name:CHARCOAL (ANIMAL)
CAS:16291-96-6
RTECS #:FL7243500
Other REC Limits:NONE RECOMMENDED

=====
Hazards Identification
=====

LD50 LC50 Mixture:LD50 (ORAL, RAT) IS NOT KNOWN.

Routes of Entry: Inhalation:YES Skin:NO Ingestion:NO
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:TARGET ORGANS:EYE, RESPIRATORY TRACT.
ACUTE- DUST MAY CAUSE MECHANICAL EYE IRRITATION. EFFECTS ON SKIN
UNKNOWN. DUST CAN CAUSE UPPER RESPIRATORY TRACT IRRITATION. MAY BE
HARMFUL IF INGESTED. CHRONIC- UNKNOWN.
Explanation of Carcinogenicity:NONE
Effects of Overexposure:IRRITATION
Medical Cond Aggravated by Exposure:PERSONS WITH PRE-EXISTING EYE
PROBLEMS OR IMPAIRED RESPIRATORY FUNCTION MAY BE MORE SUSCEPTIBLE
TO THE EFFECTS OF THIS PRODUCT.

=====
===== First Aid Measures =====

First Aid:GET MEDICAL HELP IF SYMPTOMS PERSIST. INHALED:MOVE TO FRESH
AIR. EYES:FLUSH WITH WATER FOR 15 MINUTES, HOLDING EYELIDS OPEN.
SKIN:WASH WITH SOAP & WATER. ORAL:IF CONSCIOUS, RINSE OUT MOUTH
WITH WATER. SEEK MEDICAL ATTENTION.

=====
===== Fire Fighting Measures =====

Extinguishing Media:WATER SPRAY, CARBON DIOXIDE, FOAM OR DRY CHEMICAL.
USE WATER SPRAY TO COOL FIRE EXPOSED CONTAINERS.
Fire Fighting Procedures:WEAR PROTECTIVE CLOTHING AND NIOSH-APPROVED
SELF-CONTAINED BREATHING APPARATUS. WATER STREAM CAN DISPERSE DUST
IN AIR, PRODUCING A FIRE HAZARD.
Unusual Fire/Explosion Hazard:POWDERED MATERIAL MAY FORM EXPLOSIVE
DUST-AIR MIXTURES.

=====
===== Accidental Release Measures =====

Spill Release Procedures:SWEEP UP SPILL. AVOID CREATING DUST. PLACE IN
APPROPRIATE CONTAINER FOR DISPOSAL. VENTILATE AREA AND WASH SPILL
SITE WITH WATER.
Neutralizing Agent:NOT RELEVANT

=====
===== Handling and Storage =====

Handling and Storage Precautions:STORE IN DRY PLACE. KEEP CONTAINER
TIGHTLY CLOSED. USE IN VENTILATED AREA.
Other Precautions:DO NOT RAISE DUST. AVOID CONTACT WITH EYES, SKIN OR
CLOTHING. AVOID INHALATION OF DUST. WASH THOROUGHLY AFTER HANDLING
MATERIAL. KEEP OUT OF REACH OF SMALL CHILDREN. DO NOT INGEST.

=====
===== Exposure Controls/Personal Protection =====

Respiratory Protection:NONE NORMALLY REQUIRED. IF AIRBORNE
CONCENTRATION IS HIGH, WEAR A NIOSH-APPROVED DUST RESPIRATOR OR
DUST MASK.
Ventilation:GOOD GENERAL VENTILATION IS SUFFICIENT FOR MOST CONDITIONS
(10 ROOM VOLUMES PER HOUR).
Protective Gloves:LATEX TO MINIMIZE SKIN CONTACT
Eye Protection:SAFETY GLASSES/DUST GOGGLES RECOMMENDED
Other Protective Equipment:EYE WASH STATION, PROTECTIVE CLOTHING AND/OR
UNIFORM
Work Hygienic Practices:OBSERVE GOOD PERSONAL HYGIENE PRACTICES AND
RECOMMENDED PROCEDURES.

Supplemental Safety and Health

===== Physical/Chemical Properties =====

HCC:N1
NRC/State Lic Num:NOT RELEVANT
Viscosity:NOT RELEVANT
Evaporation Rate & Reference:NOT RELEVANT
Solubility in Water:INSOLUBLE
Appearance and Odor:BLACK SOLID

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES
Hazardous Decomposition Products:CARBON MONOXIDE, CARBON DIOXIDE

===== Disposal Considerations =====

Waste Disposal Methods:THE POWDER MAY BE BURIED IN A SANITARY LANDFILL
OR INCINERATED. ENSURE COMPLIANCE WITH LOCAL, STATE AND FEDERAL
REGULATIONS.

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assume responsibility for the suitability of this information to their
particular situation.

Material Safety Data Sheet

Anthrone, 98%

ACC# 96845

Section 1 - Chemical Product and Company Identification

MSDS Name: Anthrone, 98%

Catalog Numbers: AC104960250

Synonyms: 9(10H)-Anthracenone

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
90-44-8	Anthrone	98	201-994-0

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: yellow solid.

Caution! May cause eye, skin, and respiratory tract irritation. Light sensitive. The toxicological properties of this material have not been fully investigated.

Target Organs: None known.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. The toxicological properties of this substance have not been fully investigated.

Inhalation: May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: In case of fire, use water, dry chemical, chemical foam, or alcohol-resistant foam.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: Not published.

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Reduce airborne dust and prevent scattering by moistening with water.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Avoid breathing dust, mist, or vapor. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation.

Storage: Do not store in direct sunlight. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Anthrone	none listed	none listed	none listed

OSHA Vacated PELs: Anthrone: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: yellow

Odor: None reported.

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: 721 deg C @ 760 mm Hg

Freezing/Melting Point: 153 - 156 deg C

Decomposition Temperature: Not available.

Solubility: Insoluble.

Specific Gravity/Density: Not available.

Molecular Formula: C₁₄H₁₀O

Molecular Weight: 194.23

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Light.

Incompatibilities with Other Materials: Strong oxidizing agents.

Hazardous Decomposition Products: Carbon monoxide, irritating and toxic fumes and gases, carbon dioxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 90-44-8: CB8925500

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 90-44-8: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No data available.

Teratogenicity: No data available.

Reproductive Effects: No data available.

Mutagenicity: No data available.

Neurotoxicity: No data available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not Regulated	Not Regulated
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 90-44-8 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 90-44-8: immediate.

Section 313

No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 90-44-8 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 90-44-8: 2

Canada - DSL/NDSL

CAS# 90-44-8 is listed on Canada's DSL List.

Canada - WHMIS

not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Antimony

ACC# 01610

Section 1 - Chemical Product and Company Identification

MSDS Name: Antimony

Catalog Numbers: A845-500

Synonyms: Stibium; antimony regulus

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7440-36-0	ANTIMONY	>=99.5	231-146-5

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: silver white solid.

Warning! Causes eye, skin, and respiratory tract irritation. Harmful if inhaled or swallowed. Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. May cause blood abnormalities. May cause cardiac disturbances. Inhalation of fumes may cause metal-fume fever.

Target Organs: Kidneys, liver, cardiovascular system.

Potential Health Effects

Eye: Causes eye irritation. May cause conjunctivitis.

Skin: Causes skin irritation. Chronic exposure may cause dizziness, dry throat, sleepiness, anorexia, and nausea. Chronic inhalation may result in liver, kidney, and cardiac changes.

Ingestion: May cause severe digestive tract irritation with abdominal pain, nausea,

vomiting and diarrhea. May cause slow pulse, low blood pressure, shallow breathing, and
Inhalation: Dust is irritating to the respiratory tract. Inhalation of fumes may cause metal fume fever, which is characterized by flu-like symptoms with metallic taste, fever, chills, cough, weakness, chest pain, muscle pain and increased white blood cell count.

Chronic: Prolonged or repeated skin contact may cause dermatitis. Chronic exposure may cause dizziness, dry throat, sleepiness, anorexia, and nausea. Chronic inhalation may result in liver, kidney, and cardiac changes.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Antidote: The use of Dimercaprol or BAL (British Anti-Lewisite) as a chelating agent should be determined by qualified medical personnel.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Material will burn in a fire. Dust can be an explosion hazard when exposed to heat or flame. Bulk metal is combustible in air at high temperatures.

Extinguishing Media: DO NOT USE WATER, CO₂, OR FOAM DIRECTLY ON FIRE ITSELF. Use dry sand, graphite powder, dry sodium chloride-based extinguishers.

Flash Point: Not applicable.

Autoignition Temperature: 330 deg C (626.00 deg F)

Explosion Limits, Lower:0.42 oz/ft³

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 1; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions.

Section 7 - Handling and Storage

Handling: Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes. Keep away from heat, sparks and flame. Avoid ingestion and inhalation.

Storage: Keep away from heat and flame. Do not store in direct sunlight. Store in a cool, dry, well-ventilated area away from incompatible substances. Tarnishes in moist air.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
ANTIMONY	0.5 mg/m ³ TWA	0.5 mg/m ³ TWA 50 mg/m ³ IDLH	0.5 mg/m ³ TWA

OSHA Vacated PELs: ANTIMONY: 0.5 mg/m³ TWA

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: silver white

Odor: none reported

pH: Not available.

Vapor Pressure: Negligible.

Vapor Density: Not available.

Evaporation Rate: Negligible.

Viscosity: Not available.

Boiling Point: 1635 deg C
Freezing/Melting Point:630 deg C
Decomposition Temperature:Not available.
Solubility: Insoluble in water.
Specific Gravity/Density: 6.684
Molecular Formula:Sb
Molecular Weight:121.71

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions.

Conditions to Avoid: Incompatible materials, ignition sources, moisture.

Incompatibilities with Other Materials: Incompatible with ammonium nitrate, bromine, bromine trifluoride, bromoazide, chloric acid, chlorine, chlorine monoxide, chlorine trifluoride, fluorine, iodine, nitric acid, potassium nitrate, potassium permanganate, potassium peroxide, sodium nitrate, and sodium peroxide.

Hazardous Decomposition Products: Stibine fumes.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 7440-36-0: CC4025000

LD50/LC50:

CAS# 7440-36-0:

Oral, rat: LD50 = 7 gm/kg;

Carcinogenicity:

CAS# 7440-36-0: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: Present evidence in humans is inconclusive regarding an increased risk of lung cancer and reproductive disorders from antimony exposure.

Teratogenicity: No data available.

Reproductive Effects: No data available.

Mutagenicity: No data available.

Neurotoxicity: No data available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	ANTIMONY POWDER	ANTIMONY POWDER
Hazard Class:	6.1	6.1
UN Number:	UN2871	UN2871
Packing Group:	III	III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7440-36-0 is listed on the TSCA inventory.

Health & Safety Reporting List

CAS# 7440-36-0: Effective 10/4/82, Sunset 10/4/92

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 7440-36-0: 5000 lb final RQ (no reporting of releases of this hazardous substance is required)

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

SARA Codes

CAS # 7440-36-0: immediate, delayed.

Section 313

This material contains ANTIMONY (CAS# 7440-36-0, >=99.5%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA. CAS# 7440-36-0 is listed as a Priority Pollutant under the Clean Water Act. CAS# 7440-36-0 is listed as a Toxic Pollutant under the Clean Water Act.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7440-36-0 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

XN N

Risk Phrases:

R 20/22 Harmful by inhalation and if swallowed.

R 51/53 Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Phrases:

S 61 Avoid release to the environment. Refer to special instructions /safety data sheets.

WGK (Water Danger/Protection)

CAS# 7440-36-0: No information available.

Canada - DSL/NDSL

CAS# 7440-36-0 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D1B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 7440-36-0 is listed on the Canadian Ingredient Disclosure List.

Antimony trisulfide

- Antimony sulfide
- Antimony(III) sulfide

Formula	Sb_2S_3
Structure	$\text{S}^{2-} \quad \text{Sb}^{3+} \quad \text{S}^{2-} \quad \text{Sb}^{3+} \quad \text{S}^{2-}$
Description	Gray, lustrous, crystalline masses or grayish-black powder; also exists in.
Uses	In bengal fires, manufacture ruby glass, explosives.

Registry Numbers and Inventories.

CAS	1345-04-6
NIH PubChem CID	16689752
EC (EINECS/ELINCS)	215-713-4
RTECS	CC9450000
RTECS class	Tumorigen; Human Data
UN (DOT)	1325
Merck	12,754
Beilstein/Gmelin	9566 (G)
Swiss Giftliste 1	G-7683
Canada DSL/NDSL	DSL
US TSCA	Listed
Australia AICS	Listed
New Zealand	Listed
Japan ENCS (MITI)	Listed
Korea ECL	Listed
Philippiens PICCS	Listed

Properties.

Formula	S_3Sb_2
Formula mass	339.68
Melting point, °C	550
Decomposition point, °C	1050
Density	4.12 g/cm ³

Solubility in water	Insoluble
Heat of fusion	64.1 kJ/mol

Hazards and Protection.

Storage	Store in a cool, dry place. Store in a tightly closed container.
Handling	Wash thoroughly after handling. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation. Use only in a chemical fume hood.
Protection	Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166. Skin: Wear appropriate protective gloves to prevent skin exposure. Clothing: Wear appropriate protective clothing to prevent skin exposure.
Respirators	Follow the OSHA respirator regulations found in 29CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.
Small spills/leaks	Vacuum or sweep up material and place into a suitable disposal container. Wash area with soap and water. Avoid generating dusty conditions.
Stability	Stable under normal temperatures and pressures.
Incompatibilities	Strong oxidizing agents; acids.
Decomposition	Oxides of sulfur, hydrogen sulfide, antimony/antimony oxides.

Fire.

Fire fighting	Wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Dusts at sufficient concentrations can form explosive mixtures with air. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Extinguishing media: Use foam, dry chemical, or carbon dioxide.
Fire potential	Flammable/combustible material. May be ignited by friction, heat, sparks or flames.
Combustion products	Dangerous; when heated to decompose or on contact with acid or acid fumes it emits highly toxic fumes of oxides of sulfur and antimony.

Health.

Exposure limit(s)	NIOSH REL*: TWA 0.5 mg/m3 OSHA PEL*: TWA 0.5 mg/m3 [*Note: REL and PEL also apply to other antimony compounds (as Sb).] IDLH 50 mg/m3 (as Sb)
Poison_Class	2
Exposure effects	Patients may acutely present with low heart rate, rapid heart rate, hyperventilation, respiratory depression even to the point of apnea, and/or hypo-/elevated blood pressure. Asphyxial seizures, coma, and death associated with rapid respiratory paralysis may be noted following exposure to high concentrations. Headache, sweating, vertigo, anosmia, irritability, staggering gait, disorientation, somnolence, weakness, confusion, and delirium may be noted following exposure to non-fatal levels. Spontaneous abortions have occurred after exposure to life-threatening

concentrations.

Ingestion May cause gastrointestinal irritation with nausea, vomiting and diarrhea.

Inhalation May cause respiratory tract irritation.

Skin May cause skin irritation.

Eyes May cause eye irritation.

First aid

Ingestion If victim is conscious and alert, give 2-4 cupfuls of milk or water. Get medical aid immediately.

Inhalation Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Skin Immediately flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Eyes Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Transportation.

UN number 1325

Response guide [133](#)

Hazard class 4.1

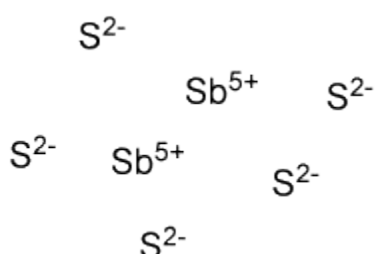


Packing Group II; III

USCG CHRIS Code ATW

Antimony pentasulfide

- Antimony sulfide, solid
- Antimony(V) sulfide
- Diantimony pentasulfide
- Antimony Red

Formula	Sb_2S_5
Structure	
Description	Orange solid.
Uses	Used as a pigment.

Registry Numbers and Inventories.

CAS	1315-04-4
NIH PubChem CID	16683083
EC (EINECS/ELINCS)	215-255-5
RTECS	CC6125000
RTECS class	Other
UN (DOT)	1325
Merck	12,738
Beilstein/Gmelin	44326 (G)
Swiss Giftliste 1	G-7682
Canada DSL/NDSL	NDSL
US TSCA	Listed
Australia AICS	Listed
New Zealand	Listed
Japan ENCS (MITI)	Listed
Korea ECL	Listed
Philippiens PICCS	Listed

Properties.

Formula	S_5Sb_2
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Formula mass	403.80
Melting point, °C	75 (decomposes)
Decomposition point, °C	75
Density	4.12 g/cm ³
Solubility in water	Reacts

Hazards and Protection.

Storage	Store in a cool, dry place. Store in a tightly closed container. Flammables-area.
Handling	Avoid breathing dust, vapor, mist, or gas. Avoid contact with skin and eyes.
Protection	Skin: Wear appropriate protective gloves to prevent skin exposure. Clothing: Wear appropriate protective clothing to prevent skin exposure.
Respirators	Follow the OSHA respirator regulations found in 29CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.
Small spills/leaks	Vacuum or sweep up material and place into a suitable disposal container.
Stability	Stable under normal temperatures and pressures.
Incompatibilities	Oxidizing agents.
Decomposition	Oxides of sulfur, hydrogen sulfide, antimony/antimony oxides.

Fire.

Fire fighting	Wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Flammable solid. Extinguishing media: Use foam, dry chemical, or carbon dioxide. DO NOT USE WATER!
Fire potential	Flammable/combustible material. May be ignited by friction, heat, sparks or flames.
Combustion products	Emits toxic fumes under fire conditions.
<u>NFPA</u>	
Health	3
Flammability	1
Reactivity	1

Health.

Exposure limit(s)	NIOSH REL*: TWA 0.5 mg/m ³ OSHA PEL*: TWA 0.5 mg/m ³ [*Note: REL and PEL also apply to other antimony compounds (as Sb).] IDLH 50 mg/m ³ (as Sb)
Poison_Class	2
Exposure effects	The toxicological properties of this substance have not been fully investigated.
Ingestion	May cause irritation of the digestive tract. The toxicological properties of this substance have not been fully investigated.

Inhalation Causes respiratory tract irritation.

Skin Causes skin irritation.

Eyes Causes eye irritation.

First aid

Ingestion Get medical aid. Wash mouth out with water.

Inhalation Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Skin Get medical aid. Flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes.

Eyes Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Transportation.

UN number 1325

Response guide [133](#)

Hazard class 4.1



Packing Group II; III

USCG CHRIS Code ATW

Material Safety Data Sheet

Antimony trioxide

ACC# 01780

Section 1 - Chemical Product and Company Identification

MSDS Name: Antimony trioxide

Catalog Numbers: AC192460000, AC192460100, AC192460500, AC213470000, AC213470010, AC213470050, AC213471000, A860-100, A860-500

Synonyms: Antimonious oxide; Antimony peroxide; Flowers of antimony.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
1309-64-4	Antimony trioxide	99-100	215-175-0

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white powder.

Warning! Possible cancer hazard. May cause cancer based on animal data. Risk of cancer depends on duration and level of exposure. Causes eye irritation. May cause skin and respiratory tract irritation. May cause lung damage.

Target Organs: Lungs, eyes, skin.

Potential Health Effects

Eye: Contact produces irritation, tearing, and burning pain. May cause chemical conjunctivitis.

Skin: May cause skin irritation. Repeated or prolonged skin contact may cause antimony measles characterized by itchy papules and pustules around the sweat and fat glands.

Ingestion: May cause irritation of the digestive tract. May cause slow pulse, low blood pressure, bloody stool, shallow breathing, coma, convulsions, and possible death.

Inhalation: May cause respiratory tract irritation. May cause ulceration and perforation of the nasal septum if inhaled in excessive quantities. Inhalation of fumes may cause metal fume fever, which is characterized by flu-like symptoms with metallic taste, fever, chills, cough, weakness, chest pain, muscle pain and increased white blood cell count. May cause lung damage. Antimony compounds may enter the body through the lungs. Inhalation may produce severe bronchitis with spasms, coughing, and chest pain.

Chronic: Possible cancer hazard based on tests with laboratory animals. Prolonged inhalation may cause respiratory tract inflammation and lung damage. Prolonged or repeated skin contact may cause dermatitis. Laboratory experiments have resulted in mutagenic effects. May cause chronic heart disease due to effects on the heart muscle. This substance has caused adverse reproductive and fetal effects in laboratory animals. Prolonged or excessive inhalation or ingestion exposures to Antimony or Antimony trioxide may result in inflammation of the lungs, airway obstruction, bronchospasm, chronic bronchitis, liver effects, blood effects, and neurological effects. Antimony trioxide has been identified by the EPA as a suspected lung

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Antidote: The use of Dimercaprol or BAL (British Anti-Lewisite) as a chelating agent should be determined by qualified medical personnel.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Use water spray to keep fire-exposed containers cool. Powder ignites and burns when heated. Containers may explode when heated.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 1; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Remove all sources of ignition. Provide ventilation.

Section 7 - Handling and Storage

Handling: Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep away from heat, sparks and flame. Avoid ingestion and inhalation. Use only in a chemical fume hood.
Storage: Store in a cool, dry, well-ventilated area away from incompatible substances. Keep containers tightly closed.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Antimony trioxide	0.5 mg/m ³ TWA (listed under Antimony).	0.5 mg/m ³ TWA (listed under Antimony).50 mg/m ³ IDLH (listed under Antimony).	0.5 mg/m ³ TWA (listed under Antimony).

OSHA Vacated PELs: Antimony trioxide: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Powder

Appearance: white

Odor: odorless

pH: Amphoteric.

Vapor Pressure: 1 mm Hg @ 574 deg C

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: 1456 deg C @ 760 mmHg

Freezing/Melting Point: 656.1 deg C

Decomposition Temperature: Not available.

Solubility: Slightly soluble in water.

Specific Gravity/Density: 5.2

Molecular Formula: Sb₂O₃

Molecular Weight: 291.4182

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions.

Conditions to Avoid: Dust generation, excess heat, moisture, high humidity.

Incompatibilities with Other Materials: Oxidizing agents, reducing agents, strong acids, bases, bromine trifluoride, halogenated agents, chlorinated rubber, halogenated acids.

Hazardous Decomposition Products: Antimony/antimony oxides.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 1309-64-4: CC5650000; CC5720000

LD50/LC50:

CAS# 1309-64-4:

Draize test, rabbit, eye: 100 mg Mild;

Oral, rat: LD50 = >34600 mg/kg;

Carcinogenicity:

CAS# 1309-64-4:

- **ACGIH:** A2 - Suspected Human Carcinogen (production)
- **California:** carcinogen, initial date 10/1/90
- **NTP:** Not listed.
- **IARC:** Group 2B carcinogen

Epidemiology: Antimony trioxide production is suspected of inducing human cancers on the basis of limited epidemiologic studies and has not assigned TLV.

Teratogenicity: No information found

Reproductive Effects: Adverse reproductive effects have occurred in experimental animals.

Mutagenicity: Mutagenic effects have occurred in humans. Mutagenic effects have occurred in experimental animals.

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: Fish: Fathead Minnow: 833mg/l; 96H; Not specified Fish: Bluegill/Sunfish: 530mg/l; 96H; Not specified. 96 Hour LD50 bluegill sunfish: >530 mg/L. 96 Hour LD50 fathead minnow: >833 mg/L.

Environmental: Antimony is expected to exist as the trioxide in the atmosphere, since most of the atmospheric releases of antimony substances result from high temperature industrial processes, from the combustion of petroleum, petroleum products and coal, and from the incineration of products that contain antimony. Slight biodegradation but will bioconcentrate.

Physical: No information available.

Other: No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	Not regulated.

Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 1309-64-4 is listed on the TSCA inventory.

Health & Safety Reporting List

CAS# 1309-64-4: Effective 10/4/82, Sunset 10/4/92

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 1309-64-4: 1000 lb final RQ; 454 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 1309-64-4: immediate, delayed.

Section 313

This material contains Antimony trioxide (listed as Antimony), 99-100%, (CAS# 1309-64-4) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

CAS# 1309-64-4 is listed as a Hazardous Substance under the CWA. CAS# 1309-64-4 is listed as a Priority Pollutant under the Clean Water Act. CAS# 1309-64-4 is listed as a Toxic Pollutant under the Clean Water Act.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 1309-64-4 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

California Prop 65

The following statement(s) is(are) made in order to comply with the California Safe Drinking Water Act:

WARNING: This product contains Antimony trioxide, a chemical known to the state of California to cause cancer.

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XN

Risk Phrases:

R 40 Limited evidence of a carcinogenic effect.

Safety Phrases:

S 22 Do not breathe dust.

S 36/37 Wear suitable protective clothing and gloves.

WGK (Water Danger/Protection)

CAS# 1309-64-4: 2

Canada - DSL/NDSL

CAS# 1309-64-4 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2A.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 1309-64-4 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Gum arabic

ACC# 95834

Section 1 - Chemical Product and Company Identification

MSDS Name: Gum arabic

Catalog Numbers: AC258850000, AC258850010, AC258850025, AC258850030, AC258852500, AC258855000 AC258855000

Synonyms: Acacia.

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
9000-01-5	Gum arabic	> 99	232-519-5

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: sand solid.

Warning! Causes severe eye irritation. May cause allergic respiratory reaction. Causes respiratory tract irritation. May cause allergic skin reaction. Causes skin irritation.

Target Organs: Lungs, eyes, skin, mucous membranes.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Causes skin irritation. May cause hives. May cause dermatitis.

Ingestion: May cause irritation of the digestive tract. Ingestion may cause allergic

Inhalation: Dust is irritating to the respiratory tract. May cause allergic respiratory reaction. May cause asthmatic attacks due to allergic sensitization of the respiratory tract.

Chronic: Chronic inhalation may cause effects similar to those of acute inhalation.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: Dusts at sufficient concentrations can form explosive mixtures with air. Wear appropriate protective clothing to prevent contact with skin and eyes. Wear a self-contained breathing apparatus (SCBA) to prevent contact with thermal decomposition products.

Extinguishing Media: For small fires, use water spray, dry chemical, carbon dioxide or chemical foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 1; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Store in a tightly closed container. Keep from contact with oxidizing materials. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Gum arabic	none listed	none listed	none listed

OSHA Vacated PELs: Gum arabic: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: sand

Odor: Not available.

pH: Neutral

Vapor Pressure: Negligible.

Vapor Density: Not available.

Evaporation Rate: Negligible.

Viscosity: Not applicable.

Boiling Point: Not available.

Freezing/Melting Point: Not available.

Decomposition Temperature: Not available.

Solubility: Soluble in water.

Specific Gravity/Density: 1.35

Molecular Formula: Not applicable.

Molecular Weight: Not available

Section 10 - Stability and Reactivity

Chemical Stability: Stable.

Conditions to Avoid: Dust generation, excess heat.

Incompatibilities with Other Materials: Acacia precipitates or gels when added to ferric salts, borax, basic lead acetate, alcohol, sodium silicate, gelatin or ammoniated tincture of guaiac.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 9000-01-5: CE5945000

LD50/LC50:

CAS# 9000-01-5:

Draize test, rabbit, eye: 36 mg/5H Severe;

Oral, mouse: LD50 = >16 gm/kg;

Oral, rabbit: LD50 = 8 gm/kg;

Oral, rat: LD50 = >16 gm/kg;

Carcinogenicity:

CAS# 9000-01-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No data available.

Teratogenicity: No data available.

Reproductive Effects: No data available.

Mutagenicity: No data available.

Neurotoxicity: No data available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a

hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 9000-01-5 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 9000-01-5: immediate.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.
None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 9000-01-5 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XN

Risk Phrases:

R 36/37/38 Irritating to eyes, respiratory system and skin.

R 42/43 May cause sensitization by inhalation and skin contact.

Safety Phrases:

S 22 Do not breathe dust.

S 24 Avoid contact with skin.

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

WGK (Water Danger/Protection)

CAS# 9000-01-5: 0

Canada - DSL/NDSL

CAS# 9000-01-5 is listed on Canada's DSL List.

Canada - WHMIS

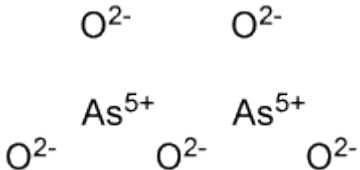
This product has a WHMIS classification of D2A, D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Arsenic pentoxide

- Arsenic acid anhydride
- Diarsenic pentaoxide
- Arsenic(V) oxide
- Arsenic anhydride
- Arsenic pentaoxide

Formula	As ₂ O ₅
Structure	
Description	A white crystalline solid.
Uses	Rodenticide, acaricide.

Registry Numbers and Inventories.

CAS	1303-28-2
NIH PubChem CID	14771
EC (EINECS/ELINCS)	215-116-9
EC Index Number	033-004-00-6
EC Class	Carc. Cat. 1; R45, T; R23/25, N; R50-53
RTECS	CG2275000
RTECS class	Agricultural Chemical and Pesticide; Tumorigen; Mutagen; Reproductive Effector
UN (DOT)	1559
Merck	12,839
Beilstein/Gmelin	17093 (G)
RCRA	P011
EPA OPP	6802
Swiss Giftliste 1	G-6980
Canada DSL/NDSL	DSL
US TSCA	Listed
Australia AICS	Listed
New Zealand	Listed
Japan ENCS (MITI)	Listed
Philippiens PICCS	Listed

Properties.

Formula	As ₂ O ₅
Formula mass	229.84
Melting point, °C	730
Odor threshold	Odorless.
Density	4.09 g/cm ³ (25 C)
Solubility in water	658 g/L

Hazards and Protection.

Storage	Poison room locked.
Handling	Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Do not get on skin or in eyes. Do not ingest or inhale. Use only in a chemical fume hood.
Protection	Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166. Skin: Wear appropriate protective gloves and clothing to prevent skin exposure. Clothing: Wear appropriate protective clothing to minimize contact with skin.
Respirators	Follow the OSHA respirator regulations found in 29CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.
Small spills/leaks	Sweep up, then place into a suitable container for disposal.
Stability	Stable under normal temperatures and pressures.
Incompatibilities	Heat, acids, oxidizing agents, halogens, moist air or water.
Decomposition	Oxides of arsenic.

Fire.

Fire fighting	Wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Extinguishing media: Use water spray to cool fire-exposed containers.
Fire potential	Arsenic pentoxide itself does not burn or burns with difficulty.
Hazards	Fire may produce irritating or poisonous gases. Reacts with metal and may give off toxic arsine gas. Hazardous polymerization may not occur.
Combustion products	Fire may produce irritating, corrosive and/or toxic gases.
NEPA	Health 3
	Flammability 0
	Reactivity 0

Health.

Exposure limit(s)	TLV (as As): ppm; 0.01 mg/m ³ A1 (ACGIH 1997). MAK: class III A1 (1997).
Carcinogin	O, G-A1, I-1, N-1, CP65
Poison_Class	1
Exposure effects	Chronic ingestion is characterized by weakness, anorexia, gastrointestinal disturbances, impairment of cognitive function, peripheral neuropathy, and skin disorders. Chronic exposure may cause liver damage. Chronic ingestion may cause fetal effects.
Ingestion	May cause liver damage. May cause severe digestive tract irritation with abdominal pain, nausea, vomiting and diarrhea. Can cause nervous system damage. May cause bone marrow depression.
Inhalation	Causes respiratory tract irritation. May cause effects similar to those described for ingestion.
Skin	May cause skin irritation. May cause skin sensitization, an allergic reaction, which becomes evident upon re-exposure to this material.
Eyes	May cause eye irritation. May result in corneal injury.
First aid	
Ingestion	If victim is conscious and alert, give 2-4 cupfuls of milk or water. Get medical aid immediately. Induce vomiting by giving one teaspoon of Syrup of Ipecac.
Inhalation	Get medical aid immediately. Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.
Skin	Flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.
Eyes	Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Transportation.

UN number	1559
Response guide	151
Hazard class	6.1
Packing Group	II
USCG CHRIS Code	APO
Std. Transport #	4923112



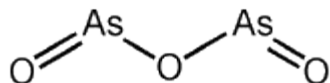
Arsenic trioxide

- Arsenous acid
- Arsenous oxide
- Arsenic(III) oxide
- Arsenous oxide anhydride
- Diarsenic trioxide
- Trisenox

Formula

As₂O₃

Structure



Description

Colorless, cubic or fibrous (arsenolite). Odorless.

Uses

Acaricide, rodenticide.

Registry Numbers and Inventories.

CAS	1327-53-3
NIH PubChem CID	14888
EC (EINECS/ELINCS)	215-481-4
EC Index Number	033-003-00-0
EC Class	Carc. Cat. 1; R45, T+; R28, C; R34, N; R50-53
RTECS	CG3325000
RTECS class	Agricultural Chemical and Pesticide; Tumorigen; Drug; Mutagen; Reproductive Effector; Human Data
UN (DOT)	1561
Merck	12,844
Beilstein/Gmelin	35185 (G)
RCRA	P012
EPA OPP	7001
Swiss Giftliste 1	G-1148
Canada DSL/NDSL	DSL
US TSCA	Listed
Australia AICS	Listed
New Zealand	Listed
Japan ENCS (MITI)	Listed
Korea ECL	Listed
Philippiens PICCS	Listed

Properties.

Formula	As ₂ O ₃
Formula mass	197.84
Melting point, °C	312
Boiling point, °C	465
Vapor pressure, mm_{Hg}	0.0002 (25 C)
Odor threshold	Odorless
Density	4.15 g/cm ³ (25 C)
Solubility in water	12 g/L
Dipole moment	0.13 D
Heat of fusion	18.4 kJ/mol
Heat of vaporization	125.1 kJ/mol

Hazards and Protection.

Storage	Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Do not store in metal containers.
Handling	Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation. Do not allow contact with water.
Protection	Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166. Skin: Wear appropriate gloves to prevent skin exposure. Clothing: Wear appropriate protective clothing to prevent skin exposure.
Respirators	Follow the OSHA respirator regulations found in 29CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.
Small spills/leaks	Vacuum or sweep up material and place into a suitable disposal container. Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, using the appropriate protective equipment. Avoid generating dusty conditions. Provide ventilation. Do not get water inside containers.
Stability	Stable under normal temperatures and pressures.
Incompatibilities	Incompatible with chlorine trifluoride, fluorine, hydrogen fluoride, oxygen difluoride, and sodium chlorate. Can generate arsine, which is an extremely poisonous gas, when arsenic compounds contact acid, alkalis, or water in the presence of an active metal (zinc, aluminum, magnesium, manganese, sodium, iron, etc).
Decomposition	Irritating and toxic fumes and gases, oxides of arsenic, arsine.

Fire.

Fire fighting	Wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Use extinguishing media appropriate to the surrounding fire. Substance is noncombustible. Extinguishing media: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire. Do NOT get water inside containers.
Fire potential	Nonflammable.
Hazards	Toxic fumes of arsenic trioxide and arsine may be formed in fire situations. Contact with halide acids will form toxic volatile halides. Reduction in acid solutions will form arsine. Arsenic trioxide and excess zinc filings will explode on heating. Avoid sodium chlorate; fluorine; chlorine trifluoride; chromic oxide; aluminum chloride; phosphorus pentoxide; hydrogen fluoride; oxygen difluoride, tannic acid; infusion cinchona and other vegetable astringent infusions and decoctions; iron in solution. It is stable in air but slowly oxidizes in acid media.
Combustion products	Toxic fumes of arsenic trioxide and arsine may be formed in fire situations.
NEPA	
Health	3
Flammability	0
Reactivity	0

Health.

Exposure limit(s)	TLV (as As): 0.01 ppm; A1 mg/m ³ (ACGIH 1996).
Carcinogen	O, G-A1, I-1, N-1, CP65
Poison_Class	1*
Exposure effects	May cause liver and kidney damage. Chronic inhalation may cause nasal septum ulceration and perforation. May cause anemia and other blood cell abnormalities. Chronic skin effects include: cracking, thickening, pigmentation, and drying of the skin. Arsenic trioxide can cause cancer in humans. Other long term effects include: anemia, liver and kidney damage. Chronic exposure to arsenical dust may cause breath shortness, nausea, chest pains, and garlic odor.
Ingestion	May be fatal if swallowed. Causes severe digestive tract burns with abdominal pain, vomiting, and possible death. May cause hemorrhaging of the digestive tract. Ingestion of arsenical compounds may cause burning of the lips, throat constriction, swallowing difficulties, severe abdominal pain, severe nausea, projectile vomiting, and profuse diarrhea. Ingestion of arsenic compounds can produce convulsions, coma, and possibly death within 24 hours.
Inhalation	May cause severe irritation of the respiratory tract with sore throat, coughing, shortness of breath and delayed lung edema. Inhalation of arsenic compounds may lead to irritation of the respiratory tract and leading to possible nasal perforation. Long-term exposure to arsenic compounds may produce impairment of peripheral circulation.
Skin	Causes irritation with burning pain, itching, and redness. May cause dermatitis. Exposure to arsenic compounds may produce hyperpigmentation of the skin and hyperkeratoses of plantar and palmar surfaces as well as both primary irritation and

sensitization types.

Eyes Contact produces irritation, tearing, and burning pain. May cause conjunctivitis.

First aid

Ingestion Induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid. DO NOT use mouth-to-mouth respiration.

Skin Get medical aid. Flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Eyes Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Transportation.

UN number 1561

Response guide [151](#)

Hazard class 6.1



Packing Group II

USCG CHRIS Code ATO

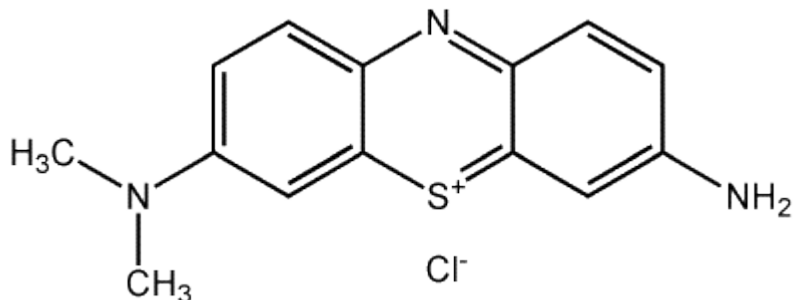
Std. Transport # 4923115

Azure A

- C.I. 52005
- Methylene Azur A
- N,N-Dimethylthionine
- 3-Amino-7-(dimethylamino)phenazathionium chloride
- 5-Chloro-3-dimethylamino-7-amino-5H-phenothiazine
- 3-Amino-7-(dimethylamino)phenothiazin-5-ium chloride

Formula $C_{14}H_{14}ClN_3S$

Structure



Description Solid.

Uses Biological stain.

Registry Numbers and Inventories.

CAS	531-53-3
NIH PubChem CID	13735
EC (EINECS/ELINCS)	208-510-7
RTECS	SP5660000
RTECS class	Mutagen
Merck	12,957
Beilstein/Gmelin	3922287
Beilstein Reference	4-27-00-05151
Canada DSL/NDSL	DSL
US TSCA	Listed
Australia AICS	Listed
New Zealand	Listed

Properties.

Formula	$C_{14}H_{14}ClN_3S$
Formula mass	291.79

Melting point, °C	290
Density	1.776 g/cm ³ (22 C)

Hazards and Protection.

Storage	Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.
Handling	Wash thoroughly after handling. Use with adequate ventilation. Avoid breathing dust, vapor, mist, or gas. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.
Protection	Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166. Skin: Wear appropriate protective gloves to prevent skin exposure. Clothing: Wear appropriate protective clothing to prevent skin exposure.
Respirators	Follow the OSHA respirator regulations found in 29CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.
Small spills/leaks	Sweep up or absorb material, then place into a suitable clean, dry, closed container for disposal. Avoid generating dusty conditions.
Stability	Stable under normal temperatures and pressures.
Incompatibilities	Strong oxidizing agents.
Decomposition	Hydrogen chloride, nitrogen oxides, carbon monoxide, oxides of sulfur, carbon dioxide.

Fire.

Fire fighting	Wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. To extinguish fire use water spray, dry chemical, carbon dioxide, or chemical foam.
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Health.

Exposure effects

Ingestion	May cause irritation of the digestive tract. The toxicological properties of this substance have not been fully investigated.
Inhalation	May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated.
Skin	May cause skin irritation.
Eyes	May cause eye irritation.
First aid	
Ingestion	If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation	Remove from exposure to fresh air immediately. Get medical aid if cough or other symptoms appear.
Skin	Get medical aid if irritation develops or persists. Flush skin with plenty of soap and water.
Eyes	Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Material Safety Data Sheet

Barbituric acid

ACC# 02264

Section 1 - Chemical Product and Company Identification

MSDS Name: Barbituric acid

Catalog Numbers: AC180920000, AC180925000, 18092-1000, O1308-100, O1309-100

Synonyms: 2,4,6(1H,3H,5H)-Pyrimidinetrione.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
67-52-7	Barbituric acid	99+	200-658-0

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: cream crystalline powder.

Caution! May cause eye, skin, and respiratory tract irritation. The toxicological properties of this material have not been fully investigated.

Target Organs: Kidneys, central nervous system, liver.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation. May be harmful if absorbed through the skin.

Ingestion: May cause irritation of the digestive tract. May be harmful if swallowed.

Inhalation: May cause respiratory tract irritation. May be harmful if inhaled.

Chronic: May cause liver and kidney damage. Exposure to high concentrations may cause central nervous system depression.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. If irritation develops, get medical aid.

Skin: Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: Do not induce vomiting. Get medical aid if irritation or symptoms occur.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or chemical foam.

Flash Point: 150 deg C (302.00 deg F)

Autoignition Temperature: Not applicable.

Explosion Limits, Lower:Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 1; Instability: 1

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation. Do not let this chemical enter the environment.

Section 7 - Handling and Storage

Handling: Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation.

Storage: Store in a cool, dry place. Store in a tightly closed container.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Barbituric acid	none listed	none listed	none listed

OSHA Vacated PELs: Barbituric acid: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Crystalline powder

Appearance: cream

Odor: odorless

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 248 - 255 deg C

Decomposition Temperature: 250 deg C

Solubility: 142 g/L (20°C)

Specific Gravity/Density: Not available.

Molecular Formula: C₄H₄N₂O₃

Molecular Weight: 128.09

Section 10 - Stability and Reactivity

Chemical Stability: Stable. However, may decompose if heated.

Conditions to Avoid: High temperatures, incompatible materials, dust generation.

Incompatibilities with Other Materials: Strong oxidizing agents.

Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, carbon dioxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 67-52-7: CP8000000

LD50/LC50:

CAS# 67-52-7:

Oral, rat: LD50 = >5 gm/kg;

Carcinogenicity:

CAS# 67-52-7: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information available.

Physical: No information available.

Other: Do not empty into drains.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not Regulated.	Not Regulated.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 67-52-7 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 67-52-7 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 67-52-7: 0

Canada - DSL/NDSL

CAS# 67-52-7 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Barium nitrate

ACC# 02440

Section 1 - Chemical Product and Company Identification

MSDS Name: Barium nitrate

Catalog Numbers: AC203150000, AC203150050, AC203155000, B53-500, NC9344971

Synonyms: Barium dinitrate; Nitric acid, barium salt.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
10022-31-8	Barium nitrate	100	233-020-5

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white crystals.

Danger! Strong oxidizer. Contact with other material may cause a fire. Harmful if inhaled or swallowed. Causes eye, skin, and respiratory tract irritation. May cause central nervous system effects. May cause kidney damage. May cause cardiac disturbances.

Target Organs: Kidneys, central nervous system, muscles, cardiovascular system.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Causes skin irritation. May be harmful if absorbed through the skin.

Ingestion: Harmful if swallowed. May cause kidney damage. Ingestion of nitrate containing compounds can lead to methemoglobinemia. The barium ion is a muscle poison causing stimulation and then paralysis. Initial symptoms are gastrointestinal, including nausea,

vomiting, colic, and diarrhea, followed by myocardial and general muscular stimulation with tingling in the extremities. The barium ion is a muscle poison causing stimulation and then paralysis. Initial symptoms are gastrointestinal, including nausea, vomiting, colic, and diarrhea, followed by myocardial and general muscular stimulation with tingling in the extremities. The barium ion is a muscle poison causing stimulation and then paralysis. Initial symptoms are gastrointestinal, including nausea, vomiting, colic, and diarrhea, followed by myocardial and general muscular stimulation with tingling in the extremities. The barium ion stimulates cardiac, smooth and striated muscle. Various motor disturbances including stiffness, cramps, weakness or paralysis of the musculature may be seen with exposure to soluble barium salts. Central nervous system stimulation may be seen followed by depression.

Inhalation: Harmful if inhaled. Causes respiratory tract irritation. Inhalation at high concentrations may cause CNS depression and asphyxiation.

Chronic: Chronic exposure may cause effects similar to those of acute exposure.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: Call a poison control center. If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: For methemoglobinemia, administer oxygen alone or with Methylene Blue depending on the methemoglobin concentration in the blood. Institute cardiac monitoring for all significant ingestions of soluble barium salts. Institute cardiac monitoring for all significant ingestions of soluble barium salts.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Strong oxidizer. Contact with other material may cause fire.

Extinguishing Media: Use water spray to cool fire-exposed containers. Contact professional fire-fighters immediately. For small fires, do NOT use dry chemicals, carbon dioxide, halon or foams. USE WATER ONLY. For large fires, flood fire area with water from a distance.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 1; Special Hazard: OX

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation. Do not use combustible materials such as paper towels to clean up spill.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Keep container tightly closed. Avoid contact with clothing and other combustible materials. Do not get on skin or in eyes. Avoid ingestion and inhalation. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames.

Storage: Keep away from heat, sparks, and flame. Do not store near combustible materials. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from reducing agents.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Barium nitrate	0.5 mg/m ³ TWA (as Ba) (listed under Barium, soluble compounds).	0.5 mg/m ³ TWA (as Ba) 50 mg/m ³ IDLH (as Ba)	0.5 mg/m ³ TWA (as Ba) (listed under Barium, soluble compounds).

OSHA Vacated PELs: Barium nitrate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear a chemical apron. Wear appropriate clothing to prevent skin exposure.
Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Crystals
Appearance: white
Odor: odorless
pH: 5.0-8.0, 5% Aq. soln.
Vapor Pressure: Negligible.
Vapor Density: 9.0
Evaporation Rate: Not available.
Viscosity: Not available.
Boiling Point: Decomposes.
Freezing/Melting Point: 592 deg C
Decomposition Temperature: > 592 deg C
Solubility: moderate
Specific Gravity/Density: 3.24 @23C
Molecular Formula: Ba(NO₃)₂
Molecular Weight: 261.34

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Dust generation.
Incompatibilities with Other Materials: Reducing agents, acids, bases, aluminum, hydroxylamine, magnesium, phosphorus, zinc, esters (e.g. butyl acetate, ethyl acetate, propyl formate), combustible and flammable materials (e.g. alkyl resins, asphalt, gasoline, grease, methyl acetone, polystyrene, polyurethane), acid anhydrides, tin chloride.
Hazardous Decomposition Products: Nitrogen oxides, barium oxide.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 10022-31-8: CQ9625000
LD50/LC50:
CAS# 10022-31-8:
Draize test, rabbit, eye: 100 mg/24H Moderate;

Draize test, rabbit, skin: 500 mg/24H Mild;
Oral, mouse: LD50 = 266 mg/kg;
Oral, rat: LD50 = 355 mg/kg;
Oral, rat: LD50 = 390 mg/kg;

Carcinogenicity:

CAS# 10022-31-8: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: No information available.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: Terrestrial: Increases the mobility of other elements in the soil. Has a high bioconcentration potential.

Physical: No information available.

Other: No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	BARIUM NITRATE	BARIUM NITRATE
Hazard Class:	5.1	5.1(6.1)
UN Number:	UN1446	UN1446
Packing Group:	II	II

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 10022-31-8 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 10022-31-8: immediate, fire.

Section 313

This material contains Barium nitrate (listed as Barium compounds, n.o.s.), 100%, (CAS# 10022-31-8) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 10022-31-8 can be found on the following state right to know lists: California, (listed as Barium, soluble compounds), New Jersey, Pennsylvania, Minnesota, (listed as Barium, soluble compounds), Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XN O

Risk Phrases:

R 20/22 Harmful by inhalation and if swallowed.

R 8 Contact with combustible material may cause fire.

Safety Phrases:

S 28 After contact with skin, wash immediately with...

WGK (Water Danger/Protection)

CAS# 10022-31-8: 1

Canada - DSL/NDSL

CAS# 10022-31-8 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of C, D1B, D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 10022-31-8 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Barium chloride, anhydrous

ACC# 02370

Section 1 - Chemical Product and Company Identification

MSDS Name: Barium chloride, anhydrous

Catalog Numbers: AC612281000, B31-100C, B31-500, B35

Synonyms: Barium dichloride.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
10361-37-2	Barium chloride	> 97	233-788-1

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid.

Warning! Causes eye, skin, and respiratory tract irritation. Harmful if inhaled or swallowed. May cause lung damage. May cause cardiac disturbances. May cause kidney damage.

Target Organs: Kidneys, heart, respiratory system, muscles.

Potential Health Effects

Eye: Contact produces irritation, tearing, and burning pain. May cause conjunctivitis.

Skin: Causes skin irritation. Prolonged contact with the skin, especially if the skin is wet or moist, causes necrosis.

Ingestion: Harmful if swallowed. May cause kidney damage. The barium ion is a muscle poison causing stimulation and then paralysis. Initial symptoms are gastrointestinal, including nausea, vomiting, colic, and diarrhea, followed by myocardial and general muscular stimulation with tingling in the extremities. Barium chloride affects the muscles (especially the smooth muscles of the cardiovascular and respiratory systems), causes salivation, tingling of the mouth or face, convulsions, numbness, muscle paralysis, respiratory failure, slow pulse rate, pulmonary edema, irregular heart beat, potassium deficiency in the

Inhalation: Harmful if inhaled. Causes respiratory tract irritation. May cause effects similar to those described for ingestion.

Chronic: Chronic exposure may cause effects similar to those of acute exposure.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid. Do NOT use mouth-to-mouth resuscitation.

Notes to Physician: Do NOT use mouth-to-mouth resuscitation.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media: Use extinguishing media most appropriate for the surrounding fire.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container.

Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Wash thoroughly after handling. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Do not ingest or inhale.

Storage: Store in a cool, dry place.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Barium chloride	none listed	0.5 mg/m ³ TWA (as Ba) 50 mg/m ³ IDLH	none listed

OSHA Vacated PELs: Barium chloride: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white

Odor: odorless

pH: Not available.

Vapor Pressure: Negligible.

Vapor Density: Not applicable.
Evaporation Rate: Negligible.
Viscosity: Not available.
Boiling Point: 1560 deg C
Freezing/Melting Point: 960 deg C
Decomposition Temperature: Not available.
Solubility: 59% @ 100°C
Specific Gravity/Density: 3.86
Molecular Formula: BaCl₂
Molecular Weight: 208.27

Section 10 - Stability and Reactivity

Chemical Stability: Stable.
Conditions to Avoid: Dust generation, excess heat.
Incompatibilities with Other Materials: Bromine trifluoride, Furan-2-peroxycarboxylic acid.
Hazardous Decomposition Products: Hydrogen chloride, chlorine.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 10361-37-2: CQ8750000
LD50/LC50:
CAS# 10361-37-2:
Oral, mouse: LD50 = 150 mg/kg;
Oral, rat: LD50 = 118 mg/kg;
Oral, rat: LD50 = 397 mg/kg;

Carcinogenicity:
CAS# 10361-37-2: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found
Teratogenicity: No information found
Reproductive Effects: No information found
Mutagenicity: No information found
Neurotoxicity: No information found
Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: Barium chloride accumulates in plants when it exceeds calcium and magnesium levels in soil.

Physical: No information available.

Other: No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	BARIUM COMPOUNDS, N.O.S.	BARIUM COMPOUNDS, N.O.S. (BARIUM CHLORIDE)
Hazard Class:	6.1	6.1
UN Number:	UN1564	UN1564
Packing Group:	III	III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 10361-37-2 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 10361-37-2: immediate, delayed.

Section 313

This material contains Barium chloride (listed as Barium compounds, n.o.s.), > 97%, (CAS# 10361-37-2) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 10361-37-2 can be found on the following state right to know lists: New Jersey, (listed as Barium compounds, n.o.s.), Pennsylvania, (listed as Barium compounds, n.o.s.).

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

T

Risk Phrases:

R 25 Toxic if swallowed.

R 20 Harmful by inhalation.

Safety Phrases:

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

WGK (Water Danger/Protection)

CAS# 10361-37-2: 1

Canada - DSL/NDSL

CAS# 10361-37-2 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D1B, D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 10361-37-2 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Barium hydroxide, anhydrous

ACC# 02420

Section 1 - Chemical Product and Company Identification

MSDS Name: Barium hydroxide, anhydrous

Catalog Numbers: 61242-2500, 61242-5000, B47-250, B47-500

Synonyms: Barium dihydroxide.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
17194-00-2	Barium hydroxide anhydrous	>95	241-234-5

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: transparent solid.

Danger! Causes burns by all exposure routes. Harmful if inhaled or swallowed. May cause blood abnormalities. May cause kidney damage. May cause central nervous system effects.

Target Organs: Kidneys, central nervous system, respiratory system, gastrointestinal system, muscles, cardiovascular system, eyes, skin.

Potential Health Effects

Eye: Causes eye burns.

Skin: Causes skin burns.

Ingestion: May cause severe and permanent damage to the digestive tract. Causes gastrointestinal tract burns. May cause respiratory failure. May cause kidney failure. May cause convulsions, increased blood pressure, muscle spasms, and possible paralysis.

Inhalation: Harmful if inhaled. Causes chemical burns to the respiratory tract.

Chronic: Chronic inhalation and ingestion may cause effects similar to those of acute inhalation and ingestion.

Section 4 - First Aid Measures

Eyes: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical aid immediately.

Skin: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid immediately. Wash clothing before reuse.

Ingestion: If swallowed, do NOT induce vomiting. Get medical aid immediately. If victim is fully conscious, give a cupful of water. Never give anything by mouth to an unconscious person.

Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Antidote: The use of d-Penicillamine as a chelating agent should be determined by qualified medical personnel.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Decomposes at high temperatures, resulting in toxic and corrosive products.

Extinguishing Media: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 3; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Minimize dust generation and accumulation. Do not get in eyes, on skin, or on clothing. Do not breathe dust. Use only with adequate ventilation.

Storage: Keep container closed when not in use. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from strong acids. Corrosives area.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use process enclosure, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Barium hydroxide anhydrous	0.5 mg/m ³ TWA (as Ba) (listed under Barium, soluble compounds).	0.5 mg/m ³ TWA (as Ba, except barium sulfate) (listed under Barium, soluble compounds).	0.5 mg/m ³ TWA (as Ba) (listed under Barium, soluble compounds).

OSHA Vacated PELs: Barium hydroxide anhydrous: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear chemical splash goggles.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: transparent

Odor: odorless

pH: Alkaline.

Vapor Pressure: Negligible.
Vapor Density: 10.9
Evaporation Rate: Negligible.
Viscosity: Not available.
Boiling Point: 780 deg C
Freezing/Melting Point: 78 deg C
Decomposition Temperature: Not available.
Solubility: Moderately in water (5.6 g/100 ml)
Specific Gravity/Density: 2.18
Molecular Formula: BaH₂O₂
Molecular Weight: 171.34

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures. Substance readily absorbs carbon dioxide from air.

Conditions to Avoid: Dust generation, excess heat.

Incompatibilities with Other Materials: Metals, strong oxidizing agents, acids.

Hazardous Decomposition Products: Barium oxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 17194-00-2: CQ9200000

LD50/LC50:

CAS# 17194-00-2:

Oral, rat: LD50 = 308 mg/kg;

Carcinogenicity:

CAS# 17194-00-2: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: No information available.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	CORROSIVE SOLIDS, TOXIC, N.O.S.	CORROSIVE SOLID, TOXIC, N.O.S.
Hazard Class:	8	8
UN Number:	UN2923	UN2923
Packing Group:	III	III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 17194-00-2 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

SARA Codes

CAS # 17194-00-2: immediate, delayed.

Section 313

This material contains Barium hydroxide anhydrous (listed as Barium compounds, n.o.s.), >95%, (CAS# 17194-00-2) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 17194-00-2 can be found on the following state right to know lists: California, (listed as Barium, soluble compounds), New Jersey, (listed as Barium compounds, n.o.s.), Pennsylvania, (listed as Barium compounds, n.o.s.), Minnesota, (listed as Barium, soluble compounds).

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

C

Risk Phrases:

R 20/22 Harmful by inhalation and if swallowed.

R 34 Causes burns.

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

WGK (Water Danger/Protection)

CAS# 17194-00-2: 1

Canada - DSL/NDSL

CAS# 17194-00-2 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D1B, E.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 17194-00-2 (listed as Barium, soluble compounds) is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Basic Fuchsin

ACC# 96948

Section 1 - Chemical Product and Company Identification

MSDS Name: Basic Fuchsin

Catalog Numbers: AC401690000, 40169-0250

Synonyms: Basic Violet 14, hydrochloride; C.I. 42510; Rosaniline chloride.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
632-99-5	Basic Fuchsin	88+	211-189-6

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: green solid.

Warning! Harmful if swallowed. Cancer hazard. May cause eye, skin, and respiratory tract irritation. May cause blood abnormalities.

Target Organs: Blood, blood forming organs.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation. May be harmful if absorbed through the skin.

Ingestion: Harmful if swallowed. May cause irritation of the digestive tract. May cause methemoglobinemia, cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood), convulsions, and death. Exposure may cause anemia and other blood abnormalities.

Inhalation: May cause respiratory tract irritation. May cause effects similar to those described for ingestion. May be harmful if inhaled.

Chronic: Chronic inhalation and ingestion may cause effects similar to those of acute inhalation and ingestion. Prolonged exposure may cause anemia and methemoglobinemia, characterized by dizziness, drowsiness, headache, breath shortness, cyanosis (bluish skin due to deficient oxygenation of the blood), rapid heart rate and chocolate-brown colored blood. May cause cancer in humans.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: Do not induce vomiting. Get medical aid immediately. Call a poison control center.

Inhalation: Remove from exposure and move to fresh air immediately. If breathing is difficult, give oxygen. Get medical aid. Do not use mouth-to-mouth resuscitation if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or chemical foam.

Flash Point: 200 deg C (392.00 deg F)

Autoignition Temperature: Not applicable.

Explosion Limits, Lower:Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 1; Instability: 1

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation. Do not let this chemical enter the environment.

Section 7 - Handling and Storage

Handling: Use only in a well-ventilated area. Minimize dust generation and accumulation. Do not get in eyes, on skin, or on clothing. Do not ingest or inhale.

Storage: Store in a cool, dry place. Store in a tightly closed container.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Basic Fuchsin	none listed	none listed	none listed

OSHA Vacated PELs: Basic Fuchsin: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: green

Odor: faint odor

pH: 5 - 6 (1 g/L aq.sol.)

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 250 deg C (decom)

Decomposition Temperature:250 deg C

Solubility: 4 g/L (25°C)

Specific Gravity/Density:Not available.

Molecular Formula:C₂₀H₂₀ClN₃

Molecular Weight:337.84

Section 10 - Stability and Reactivity

Chemical Stability: Moisture sensitive.

Conditions to Avoid: Incompatible materials, dust generation, excess heat, exposure to moist air or water.

Incompatibilities with Other Materials: Strong oxidizing agents, strong reducing agents, acids, alkalies.

Hazardous Decomposition Products: Hydrogen chloride, nitrogen oxides, carbon monoxide, carbon dioxide.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 632-99-5: CX9850000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 632-99-5:

- **ACGIH:** Not listed.
- **California:** Not listed.
- **NTP:** Not listed.
- **IARC:** Group 1 carcinogen

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information available.

Physical: No information available.

Other: Do not empty into drains.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 632-99-5 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 632-99-5 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XN

Risk Phrases:

R 22 Harmful if swallowed.

R 40 Limited evidence of a carcinogenic effect.

Safety Phrases:

S 36/37 Wear suitable protective clothing and gloves.

WGK (Water Danger/Protection)

CAS# 632-99-5: No information available.

Canada - DSL/NDSL

CAS# 632-99-5 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2A, D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

ACROS ORGANICS -- 3,3'-DIMETHOXYBENZIDINE DIHYDROCHLORIDE, 99%, 18447-0000 -- 6505-00N092383

=====
===== Product Identification =====

Product ID:3,3'-DIMETHOXYBENZIDINE DIHYDROCHLORIDE, 99%, 18447-0000
MSDS Date:07/16/1996
FSC:6505
NIIN:00N092383
Status Code:A
MSDS Number: CJRPC
=== Responsible Party ===
Company Name:ACROS ORGANICS
Address:ONE REAGENT LANE
City:FAIRLAWN
State:NJ
ZIP:07410
Country:US
Info Phone Num:800-227-6701
Emergency Phone Num:800-424-9300
Chemtrec Ind/Phone:(800)424-9300
CAGE:ACROS

==== Contractor Identification ====

Company Name:ACROS ORGANICS
Address:ONE REAGENT LANE
Box:City:FAIRLAWN
State:NJ
ZIP:07410
Country:US
Phone:800-227-6701
CAGE:ACROS

=====
===== Composition/Information on Ingredients =====

Ingred Name:3,3'-DIMETHOXYBENZIDINE DIHYDROCHLORIDE
CAS:20325-40-0
RTECS #:DD1050000
= Wt:99.

=====
===== Hazards Identification =====

LD50 LC50 Mixture:NOT AVAILABLE.
Routes of Entry: Inhalation:YES Skin:YES Ingestion:YES
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:HARMFUL IF SWALLOWED. MAY CAUSE
CANCER. CANCER SUSPECT AGENT.
Explanation of Carcinogenicity:3,3'-DIMETHOXYBENZIDINE DIHYDROCHLORIDE
- CALIFORNIA: CARCINOGEN - INITIAL DATA 10/1/90; NTP: SUSPECT
CARCINOGEN; OSHA - POSSIBLE SELECT CARCINOGEN (MFR).
Effects of Overexposure:SEE HEALTH HAZARDS.

=====
===== First Aid Measures =====

First Aid:EYES: IMMEDIATELY FLUSH WITH PLENTY OF WATER FOR AT LEAST 15
MINUTES, OCCASIONALLY LIFTING UPPER AND LOWER LIDS. SKIN: FLUSH
WITH PLENTY OF SOAP AND WATER FOR AT LEAST 15 MINUTES WHILE
REMOVING CONTAMINATED CLOTHING AND SHOES. INGESTION: DO NOT INDUCE

VOMITING. ALLOW VICTIM TO RINSE HIS MOUTH AND THEN TO DRINK 2-4 CUPFULS OF WATER, AND SEEK MEDICAL ADVICE. INHALATION: REMOVE FROM EXPOSURE TO FRESH AIR IMMEDIATELY. NOTES TO MD: TREAT SYMPTOMATICALLY AND SUPPORTIVELY.

=====
===== Fire Fighting Measures =====

Flash Point:NOT AVAILABLE
Autoignition Temp:Autoignition Temp Text:N/AV
Lower Limits:NOT AVAIL
Upper Limits:NOT AVAIL
Extinguishing Media:IN CASE OF FIRE, USE WATER, DRY CHEMICAL, CHEMICAL FOAM, OR ALCOHOL-RESISTANT FOAM.
Fire Fighting Procedures:USE NIOSH APPROVED SCBA AND FULL PROTECTIVE EQUIPMENT .
Unusual Fire/Explosion Hazard:NFPA RATING: NOT PUBLISHED.

=====
===== Accidental Release Measures =====

Spill Release Procedures:USE PROPER PERSONAL PROTECTIVE EQUIPMENT AS INDICATED IN EXPOSURE CONTROLS, PERSONAL PROTECTION SECTION. SWEEP UP, THEN PLACE INTO A SUITABLE CONTAINER FOR DISPOSAL.

=====
===== Handling and Storage =====

Handling and Storage Precautions:USE APPROPRIATE PROCEDURES TO PREVENT OPPORTUNITIES FOR DIRECT CONTACT WITH THE SKIN OR EYES AND TO PREVENT INHALATION.
Other Precautions:IN CASE OF ACCIDENT OR IF YOU FEEL UNWELL, SEEK MEDICAL ADVICE IMMEDIATELY (SHOW THE LABEL WHERE POSSIBLE). AVOID EXPOSURE - OBTAIN SPECIAL INSTRUCTIONS BEFORE USE.

=====
===== Exposure Controls/Personal Protection =====

Respiratory Protection:WEAR NIOSH OR EUROPEAN EN STANDARD EN 149 APPROVED FULL-FACEPIECE AIRLINE RESPIRATOR IN THE POSITIVE PRESSURE MODE WITH EMERGENCY ESCAPE PROVISIONS.
Ventilation:USE ADEQUATE GENERAL OR LOCAL EXHAUST VENTILATION TO KEEP AIRBORNE CONCENTRATIONS BELOW THE PERMISSIBLE EXPOSURE LIMITS.
Protective Gloves:IMPERVIOUS GLOVES .
Eye Protection:ANSI APPROVED CHEMICAL WORKERS GOGGLES .
Other Protective Equipment:ANSI APPROVED EYE WASH & DELUGE SHOWER . WEAR APPROPRIATE PROTECTIVE CLOTHING TO MINIMIZE CONTACT WITH SKIN AND TO PREVENT SKIN EXPOSURE.
Supplemental Safety and Health
PHYSICAL AND CHEMICAL PROPERTIES: MOLECULAR FORMULA: NOT AVAILABLE.
MOLECULAR WEIGHT: 317.21.

=====
===== Physical/Chemical Properties =====

Boiling Pt:B.P. Text:NOT AVAILABLE
Melt/Freeze Pt:=268.C, 514.4F
Decomp Temp:Decomp Text:NOT AVAILABLE
Vapor Pres:NOT AVAILABLE
Vapor Density:NOT AVAIL
Spec Gravity:NOT AVAILABLE
pH:NOT AVAILABLE

Viscosity:NOT AVAILABLE
Solubility in Water:NOT AVAILABLE
Appearance and Odor:GREY-PURPLE POWDER; NO ODOR AVAILABLE.

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES
STRONG OXIDIZING AGENTS.
Stability Condition to Avoid:STABLE UNDER NORMAL TEMPERATURES AND
PRESSURES. AVOID INCOMPATIBLE MATERIALS.
Hazardous Decomposition Products:HYDROGEN CHLORIDE, NITROGEN OXIDES,
CARBON MONOXIDE, CARBON DIOXIDE, NITROGEN.
Conditions to Avoid Polymerization:HAS NOT BEEN REPORTED.

===== Toxicological Information =====

Toxicological Information:THE TOXICOLOGICAL PROPERTIES OF THIS MATERIAL
HAVE NOT BEEN INVESTIGATED. SEE ACTUAL ENTRY IN RTECS FOR COMPLETE
INFORMATION.

===== Ecological Information =====

Ecological:FOR FURTHER INFORMATION, CONTACT ACROS ORGANICS.

===== Disposal Considerations =====

Waste Disposal Methods:DISPOSE OF IN A MANNER CONSISTENT WITH FEDERAL,
STATE AND LOCAL REGULATIONS.

===== MSDS Transport Information =====

Transport Information:U.S. DOT: SHIPPING NAME: TOXIC SOLID, ORGANIC,
N.O.S. HAZARD CLASS: 6.1. UN NUMBER: 2811. PACKING GROUP: III. --
I.M.O.: SHIPPING NAME: TOXIC SOLID, ORGANIC, N.O.S. HAZARD CLASS:
6.1. UN NUMBER: 2811. PACKING GROUP: III. -- I.A.T.A.: SHIPPING
NAME: TOXIC SOLID, ORGANIC, N.O.S. HAZARD CLASS: 6.1. UN NUMBER:
2811. PACKING GROUP III. -- R.I.D./A.D.R.:SHIPPING NAME:TOXIC
SOLID, ORGANIC, N.O.S. UN NUMBER: 2811. DANGEROUS GOODS CODE: 6.1
(25C). -- CANADIAN T.D.G.: SHIPPING NAME: POISONOUS SOLID NOS
(DIMETHOXYBENZIDINE DIHYDROCHLOR). HAZARD CLASS: 6.1 (9.2). UN
NUMBER: UN2811.

===== Regulatory Information =====

Federal Regulatory Information:EUROPEAN/INTERNATIONAL REGS: EUROPEAN
LABELING I/A/W EC DIRECTIVES: HAZ SYMBOLS: T. RISK PHRASES: R 22 -
HARMFUL IF SWALLOWED; F 45 - MAY CAUSE CANCER. SAFETY PHRASES: S 45
- IN CASE OF ACCIDENT OR IF YOU FEEL UNWELL, SEEK MED ADVICE IMMED
(SHOW LABEL WHERE POSS); S 53 - AVOID EXPOS - OBTAIN SPECIAL
INSTRUCTIONS BEFORE USE. WGK (WATER DANGER/PROT): CAS #20325-40-0:
NO INFO AVAIL. CANADA: CAS #20325-40-0 IS LISTED ON CANADA'S
DSL/NDSL LIST; CAS #20325-40-0 IS NOT LISTED ON CANADA'S ING
DISCLOSURE LIST. EXPOS LIMS: N/P. U.S. FEDERAL: TSCA: CAS
#20325-40-0 IS LISTED ON THE TSCA INVENTORY.

===== Other Information =====

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SIGMA CHEMICAL CO -- BENZIDINE DIHYDROCHLORIDE, B3383 -- 6810-00N089701

=====
Product Identification
=====

Product ID: BENZIDINE DIHYDROCHLORIDE, B3383
MSDS Date: 07/01/1994
FSC: 6810
NIIN: 00N089701
Status Code: A
MSDS Number: CHWLB
=== Responsible Party ===
Company Name: SIGMA CHEMICAL CO
Box: 14508
City: ST LOUIS
State: MO
ZIP: 63178
Country: US
Info Phone Num: 800-325-3010
Emergency Phone Num: 314-771-5765
CAGE: 21076
=== Contractor Identification ===
Company Name: SIGMA CHEMICAL COMPANY
Address: 3050 SPRUCE ST
Box: 14508
City: ST LOUIS
State: MO
ZIP: 63178
Country: US
Phone: 314-771-5765
CAGE: 21076

=====
Composition/Information on Ingredients
=====

Ingred Name: BENZIDINE, DIHYDROCHLORIDE
CAS: 531-85-1
OSHA PEL: N/K
ACGIH TLV: N/K

=====
Hazards Identification
=====

LD50 LC50 Mixture: NONE SPECIFIED BY MANUFACTURER.
Routes of Entry: Inhalation: YES Skin: YES Ingestion: YES
Reports of Carcinogenicity: NTP: NO IARC: NO OSHA: NO
Health Hazards Acute and Chronic: ACUTE: MAY BE FATAL IF INHALED,
SWALLOWED/ABSORBED THRU SKIN. READILY ABSORBED THRU SKIN. CAUSES
EYE & SKIN IRRIT. MATL IS IRRIT TO MUC MEMBS & UPPER RESP TRACT.
EXPOS CAN CAUSE DMG TO LIVER/KIDNEYS, BLOOD EFTS, DERM. OTHER
SYMPMS OF EXPOS CAN INCL NAUS, VOMIT, PAINFUL & IRREG URINATION.
CHRONIC: CARCIN. (EFTS OF OVEREXP)
Explanation of Carcinogenicity: NOT RELEVANT
Effects of Overexposure: HLTH HAZ: MUTAGEN. TARGET ORG(S): BLADDER, LIVER,
KIDNEYS, SKIN, BLOOD. TO THE BEST OF MFR'S KNOWLEDGE, CHEM,
PHYSICAL & TOX PROPERTIES HAVE NOT BEEN THORO INVESTIGATED. TARGET
ORG DATA: LIVER, ENDOCRINE, SKIN & APPENDAGES (TUMORS); TUMORIGENIC
(CARCIN BY RTECS CRITERIA; EQUIVOCAL TUMORIGENIC AGENT BY RTECS
CRITERIA).
Medical Cond Aggravated by Exposure: NONE SPECIFIED BY MANUFACTURER.

=====
First Aid Measures
=====

First Aid:INGEST:WASH OUT MOUTH W/WATER PROVIDE PERS IS CONSCIOUS. CALL MD. SKIN:FLUSH W/COPIOUS AMTS OF WATER FOR AT LST 15 MINS. REMOVE CONTAM CLTHG & SHOES. CALL MD. DISCARD CONTAM CLTHG & SHOES. INHAL:REMOV E TO FRESH AIR. IF BRTHG BECOMES DFCLT,CALL MD. EYES:FLUSH W/COPIOUS AMTS OF ATER FOR AT LST 15 MINS. ASSURE ADEQ FLUSHING BY SEPARATING LIDS W/FINGERS. CALL MD.

=====
Fire Fighting Measures
=====

Extinguishing Media:CARBON DIOXIDE, DRY CHEMICAL POWDER OR APPROPRIATE FOAM.
Fire Fighting Procedures:USE NIOSH APPROVED SCBA & FULL PROTECTIVE EQUIPMENT .
Unusual Fire/Explosion Hazard:EMITS TOXIC FUMES UNDER FIRE CONDITIONS.

=====
Accidental Release Measures
=====

Spill Release Procedures:EVACUATE AREA. FULL-PROT CLTHG. NIOSH APPRVD SCBA SHOULD BE WORN. COVER W/9:1 MIXT OF SAND & SODA ASH. AFTER MIXING, TRANSFER INTO PAPER CARTON. AVOID RAISING DUST. VENT AREA & WASH SPILL SITE AFTER M ATL PICKUP IS COMPLETE.
Neutralizing Agent:9:1 MIXTURE OF SAND & SODA ASH.

=====
Handling and Storage
=====

Handling and Storage Precautions:DO NOT BREATHE DUST. DO NOT GET IN EYES, ON SKIN, ON CLTHG. AVOID PRLNG/RPTD EXPOS. HIGHLY TOXIC. IRRITANT. MUTAGEN. CARCINOGEN. KEEP TIGHTLY CLOSED.
Other Precautions:MAY CAUSE CANCER. MAY CAUSE HERITABLE GENETIC DAMAGE. VERY TOXIC BY INHALATION, IN CONTACT W/SKIN & IF SWALLOWED. IN CASE OF ACCIDENT OR IF YOU FEEL UNWELL, SEEK MEDICAL ADVICE IMMEDIATELY (SHOW LABEL WHERE POSSIBLE).

=====
Exposure Controls/Personal Protection
=====

Respiratory Protection:NIOSH APPROVED SELF-CONTAINED BREATHING APPARATUS SHOULD BE WORN.
Ventilation:USE ONLY IN A CHEMICAL FUME HOOD.
Protective Gloves:HEAVY RUBBER GLOVES.
Eye Protection:ANSI APPROVED CHEM WORKERS GOGGS .
Other Protective Equipment:EYE WASH FOUNTAIN & DELUGE SHOWER WHICH MEET ANSI DESIGN CRITERIA .
Work Hygienic Practices:WASH THOROUGHLY AFTER HANDLING.
Supplemental Safety and Health
NONE SPECIFIED BY MANUFACTURER.

=====
Physical/Chemical Properties
=====

Melt/Freeze Pt:M.P/F.P Text:>572F,>300C
Solubility in Water:SOLUBLE
Appearance and Odor:NONE SPECIFIED BY MANUFACTURER.

=====
Stability and Reactivity Data
=====

Stability Indicator/Materials to Avoid: YES
STRONG OXIDIZING AGENTS. WILL IGNITE ON CONTACT W/RED FUMING NITRIC
ACID.

Stability Condition to Avoid: HEAT.

Hazardous Decomposition Products: TOXIC FUMES OF: CARBON MONOXIDE,
CARBON DIOXIDE, NITROGEN OXIDES, HYDROGEN CHLORIDE GAS.

===== Disposal Considerations =====

Waste Disposal Methods: DISSOLVE OR MIX MATERIAL W/COMBUSTIBLE SOLVENT &
BURN IN A CHEMICAL INCINERATOR EQUIPPED W/AFTERBURNER & SCRUBBER.
OBSERVE ALL FEDERAL, STATE & LOCAL ENVIRONMENTAL REGULATIONS.

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assume responsibility for the suitability of this information to their
particular situation.

Material Safety Data Sheet

Bismuth nitrate

ACC# 90071

Section 1 - Chemical Product and Company Identification

MSDS Name: Bismuth nitrate

Catalog Numbers: S75055, S93140

Synonyms: Nitric acid, bismuth(+3) salt.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
10361-44-1	Bismuth nitrate	100	233-791-8

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white crystals.

Danger! Strong oxidizer. Contact with other material may cause a fire. Causes eye, skin, and respiratory tract irritation. May cause methemoglobinemia. Hygroscopic (absorbs moisture from the air).

Target Organs: Blood, respiratory system, eyes, skin.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Causes skin irritation.

Ingestion: May cause irritation of the digestive tract. Ingestion of nitrate containing compounds can lead to methemoglobinemia.

Inhalation: Dust is irritating to the respiratory tract. May cause methemoglobinemia,

cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood), convulsions, tachycardia, dyspnea (labored breathing), and death. May cause acute pulmonary edema, asphyxia, chemical pneumonitis, and upper airway obstruction caused by edema.

Chronic: May cause kidney injury. May cause methemoglobinemia, which is characterized by chocolate-brown colored blood, headache, weakness, dizziness, breath shortness, cyanosis (bluish skin due to deficient oxygenation of blood), rapid heart rate, unconsciousness and possible death.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists. Wash clothing before reuse.

Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. Get medical aid if cough or other symptoms appear. Do NOT use mouth-to-mouth resuscitation. If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask.

Notes to Physician: For methemoglobinemia, administer oxygen alone or with Methylene Blue depending on the methemoglobin concentration in the blood.

Antidote: Methylene blue, alone or in combination with oxygen is indicated as a treatment in nitrite induced methemoglobinemia.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Strong oxidizer. Contact with other material may cause fire.

Extinguishing Media: May require flooding with water in order to eliminate hazardous reactions since the materials generate their own oxygen.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 1; Special Hazard: OX

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Keep combustibles (wood, paper, oil, etc.,) away from spilled material.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep from contact with clothing and other combustible materials. Avoid breathing dust. Inform laundry personnel of contaminant's hazards.
Storage: Do not store near combustible materials. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Store protected from moisture. Avoid storage on wood floors.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Bismuth nitrate	none listed	none listed	none listed

OSHA Vacated PELs: Bismuth nitrate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate clothing to prevent skin exposure.

Respirators: Wear a NIOSH/MSHA or European Standard EN 149 approved full-facepiece airline respirator in the positive pressure mode with emergency escape provisions.

Section 9 - Physical and Chemical Properties

Physical State: Crystals
Appearance: white
Odor: No data
pH: Not available.
Vapor Pressure: Not available.
Vapor Density: Not available.
Evaporation Rate: Not available.
Viscosity: Not available.
Boiling Point: Not available.
Freezing/Melting Point: 30 deg C
Decomposition Temperature: Not available.
Solubility: Decomposed by water.
Specific Gravity/Density: 2.83
Molecular Formula: BiN3O9
Molecular Weight: 394.9987

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions.

Conditions to Avoid: High temperatures, dust generation, moisture.

Incompatibilities with Other Materials: Reducing agents, strong acids, finely powdered metals, organic materials, combustible materials.

Hazardous Decomposition Products: Nitrogen oxides, bismuth oxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 10361-44-1: EB2984400

LD50/LC50:

CAS# 10361-44-1:

Oral, mouse: LD50 = >357 mg/kg; <BR.

Carcinogenicity:

CAS# 10361-44-1: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found.

Teratogenicity: No information found.

Reproductive Effects: See actual entry in RTECS for complete information.

Mutagenicity: No information found.

Neurotoxicity: No information found.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	DOT regulated - small quantity provisions apply (see 49CFR173.4)	NITRATES INORGANIC NOS (BISMUTH NITRATE, 5HYDRATE)
Hazard Class:		5.1
UN Number:		UN1477
Packing Group:		III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 10361-44-1 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 10361-44-1: flammable.

Section 313

This material contains Bismuth nitrate (listed as Water Dissociable Nitrate Compounds), 100%, (CAS# 10361-44-1) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 10361-44-1 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XI O

Risk Phrases:

R 36/37/38 Irritating to eyes, respiratory system and skin.

R 8 Contact with combustible material may cause fire.

Safety Phrases:

S 17 Keep away from combustible material.

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 37/39 Wear suitable gloves and eye/face protection.

WGK (Water Danger/Protection)

CAS# 10361-44-1: No information available.

Canada - DSL/NDSL

CAS# 10361-44-1 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of C, D2B.

Canadian Ingredient Disclosure List

CAS# 10361-44-1 is not listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Bismuth subnitrate

ACC# 89455

Section 1 - Chemical Product and Company Identification

MSDS Name: Bismuth subnitrate

Catalog Numbers: AC611355000, B344-500

Synonyms: Bismuth hydroxide nitrate oxide; Basic bismuth nitrate.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
1304-85-4	Bismuth subnitrate	90	215-136-8

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white powder.

Danger! Strong oxidizer. Contact with other material may cause a fire. Causes eye, skin, and respiratory tract irritation. May cause methemoglobinemia.

Target Organs: Blood, respiratory system, eyes, skin.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Causes skin irritation.

Ingestion: Methemoglobinemia is characterized by dizziness, drowsiness, headache, shortness of breath, cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood), rapid heart rate and chocolate-brown colored blood. Ingestion of nitrate containing compounds can lead to methemoglobinemia. May cause visual changes with

blurred vision. Opacities may form in the cornea.

Inhalation: May cause effects similar to those described for ingestion.

Chronic: May cause methemoglobinemia, which is characterized by chocolate-brown colored blood, headache, weakness, dizziness, breath shortness, cyanosis (bluish skin due to deficient oxygenation of blood), rapid heart rate, unconsciousness and possible death.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Get medical aid if irritation develops or persists. Flush skin with plenty of soap and water.

Ingestion: If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Get medical aid immediately. Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Strong oxidizer. Contact with other material may cause fire.

Extinguishing Media: Use water spray to cool fire-exposed containers. Use flooding quantities of water as spray.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 1; Special Hazard: OX

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container.

Avoid generating dusty conditions. Provide ventilation. Keep combustibles (wood, paper, oil, etc.,) away from spilled material.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with skin and eyes. Avoid contact with clothing and other combustible materials. Avoid breathing dust. Inform laundry personnel of contaminant's hazards.

Storage: Do not store near combustible materials. Store in a cool, dry place. Store protected from light.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Bismuth subnitrate	none listed	none listed	none listed

OSHA Vacated PELs: Bismuth subnitrate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Powder

Appearance: white

Odor: odorless

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 260 deg C

Decomposition Temperature:260 deg C

Solubility: Insoluble.

Specific Gravity/Density:4.93 g/cm³

Molecular Formula:Bi₅O(OH)₉(NO₃)₄

Molecular Weight:1462.03

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions.

Conditions to Avoid: Light, dust generation, excess heat.

Incompatibilities with Other Materials: Strong reducing agents, sulfur, iodides, bicarbonates, calomel, tannin, organic materials, gallic acid, salicylic acid, combustible materials.

Hazardous Decomposition Products: Nitrogen oxides, bismuth oxide.

Hazardous Polymerization: Has not been reported

Section 11 - Toxicological Information

RTECS#:

CAS# 1304-85-4: EB2977000

LD50/LC50:

Not available.

Infant TDLo oral; Dose: 259 mg/kg. Toxic effects: Blood - methemoglobinemia - carboxyhemoglobin.

Carcinogenicity:

CAS# 1304-85-4: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No data available.

Teratogenicity: No data available.

Reproductive Effects: No data available.

Mutagenicity: No data available.

Neurotoxicity: No data available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	NITRATES, INORGANIC, N.O.S.	NITRATES, INORGANIC, N.O.S.
Hazard Class:	5.1	5.1
UN Number:	UN1477	UN1477
Packing Group:	II	II

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 1304-85-4 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313

This material contains Bismuth subnitrate (listed as Water Dissociable Nitrate Compounds), 90%, (CAS# 1304-85-4) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 1304-85-4 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

XI O

Risk Phrases:

R 36/37/38 Irritating to eyes, respiratory system and skin.

R 8 Contact with combustible material may cause fire.

Safety Phrases:

S 17 Keep away from combustible material.

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 37/39 Wear suitable gloves and eye/face protection.

WGK (Water Danger/Protection)

CAS# 1304-85-4: No information available.

Canada - DSL/NDSL

CAS# 1304-85-4 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of C, D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 1304-85-4 is not listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Boric acid, reagent acs (crystals)

ACC# 95423

Section 1 - Chemical Product and Company Identification

MSDS Name: Boric acid, reagent acs (crystals)

Catalog Numbers: AC423480000, AC423480020, AC423485000

Synonyms: Boracic Acid; Hydrogen Borate; Orthoboric Acid.

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
10043-35-3	Boric acid	99.0	233-139-2

Hazard Symbols: None listed.

Risk Phrases: None listed.

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid. **Caution!** May cause eye and skin irritation. May cause central nervous system effects. May cause respiratory tract irritation. Causes severe digestive tract irritation with pain, nausea, vomiting and diarrhea. May corrode the digestive tract with hemorrhaging and possible shock. Can cause adverse reproductive effects. May cause cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood).

Target Organs: Kidneys, central nervous system, cardiovascular system.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation. May be absorbed through damaged or abraded skin in harmful amounts.

Ingestion: Causes gastrointestinal irritation with nausea, vomiting and diarrhea. May cause central nervous system depression, characterized by excitement, followed by headache, dizziness, drowsiness, and nausea. Advanced stages may cause collapse, unconsciousness,

coma and possible death due to respiratory failure. May cause tissue anoxia, characterized by weakness, headache, dizziness, confusion, cyanosis (bluish skin due to deficient oxygenation of the blood), weak and irregular heart beat, collapse, unconsciousness, convulsions, coma and death.

Inhalation: May cause respiratory tract irritation.

Chronic: Prolonged or repeated skin contact may cause dermatitis. Chronic poisoning by boron compounds, borism, may be little more than dry skin and mucous membranes, followed by appearance of a red tongue, patchy alopecia (hair loss), cracked lips, and conjunctivitis. Infants and young children are more susceptible to boric acid poisoning than adults.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists. Wash clothing before reuse.

Ingestion: Call a poison control center. If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Get medical aid immediately. Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

Notes to Physician: Treat symptomatically and supportively.

Antidote: None reported.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use only in a well-ventilated area. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Store in a cool, dry, well-ventilated area away from incompatible substances. Keep containers tightly closed.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate ventilation to keep airborne concentrations low.
Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Boric acid	none listed	none listed	none listed

OSHA Vacated PELs: Boric acid: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white

Odor: odorless

pH: 5.2 (1% sol. at 20C)

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Negligible.

Viscosity: Not applicable.
Boiling Point: Not available.
Freezing/Melting Point: 339 deg F
Decomposition Temperature: Not available.
Solubility: 4.9g/100g water at 20C.
Specific Gravity/Density: 1.44 (Water=1)
Molecular Formula: H3BO3
Molecular Weight: 61.8292

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions.

Conditions to Avoid: High temperatures, dust generation.

Incompatibilities with Other Materials: Incompatible with acetic anhydride and potassium. Reacts with basic materials to form borate salts.

Hazardous Decomposition Products: Oxides of boron.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 10043-35-3: ED4550000; ED4560000

LD50/LC50:

CAS# 10043-35-3:

Oral, mouse: LD50 = 3450 mg/kg;

Oral, rat: LD50 = 2660 mg/kg;

Oral, rat: LD50 = 2500 mg/kg; <BR.

Carcinogenicity:

CAS# 10043-35-3: Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Neurotoxicity: No information available.

Mutagenicity: No information available.

Other Studies: None.

Section 12 - Ecological Information

Ecotoxicity: Water flea Daphnia: LC50 = 115.0-153.0 mg/L; 48 Hr.; Static Condition

Mosquito fish (fresh water) TLM=1800 ppm/24H Mosquito fish (fresh water) TLM=1800 ppm/24H

Environmental: No information reported.

Physical: No information available.

Other: None.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	IATA	RID/ADR	IMO	Canada TDG
Shipping Name:	No information available.				No information available.
Hazard Class:					
UN Number:					
Packing Group:					

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 10043-35-3 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

SARA

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

SARA Codes

CAS # 10043-35-3: acute, chronic.

Section 313

No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants. This material does not contain any Class 1 Ozone depletors. This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 10043-35-3 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

WGK (Water Danger/Protection)

CAS# 10043-35-3: 1

Canada - DSL/NDSL

CAS# 10043-35-3 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

Canadian Ingredient Disclosure List

CAS# 10043-35-3 is listed on the Canadian Ingredient Disclosure List.

Exposure Limits

CAS# 10043-35-3: OEL-RUSSIA: STEL 10 mg/m³

Material Safety Data Sheet

Boric acid, powder, 99+%

ACC# 95421

Section 1 - Chemical Product and Company Identification

MSDS Name: Boric acid, powder, 99+%

Catalog Numbers: AC180570000, AC180570010, AC180570025

Synonyms: Boracic Acid; Hydrogen Borate; Orthoboric Acid.

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
10043-35-3	Boric acid	99.0	233-139-2

Hazard Symbols: None listed.

Risk Phrases: None listed.

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid. **Caution!** May cause eye and skin irritation. May cause central nervous system effects. May cause respiratory tract irritation. Causes severe digestive tract irritation with pain, nausea, vomiting and diarrhea. May corrode the digestive tract with hemorrhaging and possible shock. Can cause adverse reproductive effects. May cause cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood).

Target Organs: Kidneys, central nervous system, cardiovascular system.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation. May be absorbed through damaged or abraded skin in harmful amounts.

Ingestion: Causes gastrointestinal irritation with nausea, vomiting and diarrhea. May cause central nervous system depression, characterized by excitement, followed by headache, dizziness, drowsiness, and nausea. Advanced stages may cause collapse, unconsciousness,

coma and possible death due to respiratory failure. May cause tissue anoxia, characterized by weakness, headache, dizziness, confusion, cyanosis (bluish skin due to deficient oxygenation of the blood), weak and irregular heart beat, collapse, unconsciousness, convulsions, coma and death.

Inhalation: May cause respiratory tract irritation.

Chronic: Prolonged or repeated skin contact may cause dermatitis. Chronic poisoning by boron compounds, borism, may be little more than dry skin and mucous membranes, followed by appearance of a red tongue, patchy alopecia (hair loss), cracked lips, and conjunctivitis. Infants and young children are more susceptible to boric acid poisoning than adults.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists. Wash clothing before reuse.

Ingestion: Call a poison control center. If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Get medical aid immediately. Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

Notes to Physician: Treat symptomatically and supportively.

Antidote: None reported.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use only in a well-ventilated area. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Store in a cool, dry, well-ventilated area away from incompatible substances. Keep containers tightly closed.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate ventilation to keep airborne concentrations low.
Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Boric acid	none listed	none listed	none listed

OSHA Vacated PELs: Boric acid: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white

Odor: odorless

pH: 5.2 (1% sol. at 20C)

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Negligible.

Viscosity: Not applicable.
Boiling Point: Not available.
Freezing/Melting Point: 339 deg F
Decomposition Temperature: Not available.
Solubility: 4.9g/100g water at 20C.
Specific Gravity/Density: 1.44 (Water=1)
Molecular Formula: H3BO3
Molecular Weight: 61.8292

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions.
Conditions to Avoid: High temperatures, dust generation.
Incompatibilities with Other Materials: Incompatible with acetic anhydride and potassium. Reacts with basic materials to form borate salts.
Hazardous Decomposition Products: Oxides of boron.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 10043-35-3: ED4550000; ED4560000
LD50/LC50:
CAS# 10043-35-3:
Oral, mouse: LD50 = 3450 mg/kg;
Oral, rat: LD50 = 2660 mg/kg;
Oral, rat: LD50 = 2500 mg/kg; <BR.

Carcinogenicity:
CAS# 10043-35-3: Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA.
Epidemiology: No information available.
Teratogenicity: No information available.
Reproductive Effects: No information available.
Neurotoxicity: No information available.
Mutagenicity: No information available.
Other Studies: None.

Section 12 - Ecological Information

Ecotoxicity: Water flea Daphnia: LC50 = 115.0-153.0 mg/L; 48 Hr.; Static Condition

Mosquito fish (fresh water) TLM=1800 ppm/24H Mosquito fish (fresh water) TLM=1800 ppm/24H

Environmental: No information reported.

Physical: No information available.

Other: None.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	IATA	RID/ADR	IMO	Canada TDG
Shipping Name:	No information available.				No information available.
Hazard Class:					
UN Number:					
Packing Group:					

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 10043-35-3 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

SARA

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

SARA Codes

CAS # 10043-35-3: acute, chronic.

Section 313

No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants. This material does not contain any Class 1 Ozone depleters. This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 10043-35-3 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

WGK (Water Danger/Protection)

CAS# 10043-35-3: 1

Canada - DSL/NDSL

CAS# 10043-35-3 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

Canadian Ingredient Disclosure List

CAS# 10043-35-3 is listed on the Canadian Ingredient Disclosure List.

Exposure Limits

CAS# 10043-35-3: OEL-RUSSIA: STEL 10 mg/m³

Material Safety Data Sheet

Bromocresol Green

ACC# 60160

Section 1 - Chemical Product and Company Identification

MSDS Name: Bromocresol Green

Catalog Numbers: B383-5

Synonyms: BCG; Bromocresol blue; M-cresol 4,4'-(3H-2,1-benzoxathiol-3-ylidene)bis(2,6-dibromo-s,s-dioxide);

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
76-60-8	Bromocresol green	ca. 100	200-972-8

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: beige to brown crystalline powder.

Caution! May cause eye and skin irritation. May cause respiratory and digestive tract irritation. The toxicological properties of this material have not been fully investigated.

Target Organs: None known.

Potential Health Effects

Eye: Dust may cause mechanical irritation. This product contains an anionic dye. Similar dyes have not caused injury to the cornea or conjunctiva in documented exposure cases with human or rabbit eyes.

Skin: May cause skin irritation. No information regarding skin irritation and other potential effects was found.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. The toxicological properties of this substance have not been fully investigated.

Inhalation: May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated.

Chronic: May be harmful if ingested in large amounts.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: In case of fire, use water, dry chemical, chemical foam, or alcohol-resistant foam. Use agent most appropriate to extinguish fire.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep containers tightly closed.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Bromocresol green	none listed	none listed	none listed

OSHA Vacated PELs: Bromocresol green: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Crystalline powder

Appearance: beige to brown

Odor: odorless

pH: Not available.

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Evaporation Rate: Not applicable.
Viscosity: Not applicable.
Boiling Point: Not applicable.
Freezing/Melting Point: 225 deg C
Decomposition Temperature: 225 deg C
Solubility: Slightly soluble in water.
Specific Gravity/Density: Not available.
Molecular Formula: C₂₁H₁₄Br₄O₅S
Molecular Weight: 698.04

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Incompatible materials, dust generation, excess heat.
Incompatibilities with Other Materials: Strong oxidizing agents.
Hazardous Decomposition Products: Carbon monoxide, oxides of sulfur, irritating and toxic fumes and gases, carbon dioxide, hydrogen bromide.
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:
CAS# 76-60-8: SJ7456000
LD50/LC50:
Not available.

Carcinogenicity:
CAS# 76-60-8: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found
Teratogenicity: No information found
Reproductive Effects: No information found
Mutagenicity: No information found
Neurotoxicity: No information found
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not Regulated	Not Regulated
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 76-60-8 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 76-60-8 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

Not available.

Risk Phrases:**Safety Phrases:****WGK (Water Danger/Protection)**

CAS# 76-60-8: No information available.

Canada - DSL/NDSL

CAS# 76-60-8 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Bromothymol blue

ACC# 60100

Section 1 - Chemical Product and Company Identification

MSDS Name: Bromothymol blue

Catalog Numbers: AC151360000, AC151360050, AC151360250, AC151361000, AC403250000, AC403250010, AC403250050, AC403250100, AC403250250, B388-10, NC9785507, S71920-2

Synonyms: Bromothymol Blue; Dibromothymolsulfophthalein; 3,3'-Dibromothymolsulfophthalein; Bromothymolblue, Water Soluble; Bromothymol Blue,

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
76-59-5	Bromothymol blue	>97	200-971-2

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: brown crystalline powder.

Caution! May cause eye, skin, and respiratory tract irritation. The toxicological properties of this material have not been fully investigated.

Target Organs: None.

Potential Health Effects

Eye: May cause eye irritation. This product contains an anionic dye. Similar dyes have not caused injury to the cornea or conjunctiva in documented exposure cases with human or rabbit eyes.

Skin: May cause skin irritation. May be harmful if absorbed through the skin.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. May be harmful if swallowed.

Inhalation: May cause respiratory tract irritation. May be harmful if inhaled.

Chronic: Allergic reactions have occurred with similar compounds.

Section 4 - First Aid Measures

Eyes: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical aid.

Skin: In case of contact, flush skin with plenty of water. Remove contaminated clothing and shoes. Get medical aid if irritation develops and persists. Wash clothing before reuse.

Ingestion: If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Runoff from fire control or dilution water may cause pollution.

Extinguishing Media: In case of fire, use water, dry chemical, chemical foam, or alcohol-resistant foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container.

Clean up spills immediately, observing precautions in the Protective Equipment section.

Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Store in a cool, dry place. Store in a tightly closed container. Keep containers tightly closed.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Bromothymol blue	none listed	none listed	none listed

OSHA Vacated PELs: Bromothymol blue: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Crystalline powder

Appearance: light pink - purple - brown

Odor: odorless

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate:Not available.
Viscosity: Not available.
Boiling Point: Not available.
Freezing/Melting Point:204 deg C decomp.
Decomposition Temperature:Not available.
Solubility: Sparingly soluble in water.
Specific Gravity/Density:Not available.
Molecular Formula:C₂₇H₂₇Br₂O₅Na
Molecular Weight:646.0438

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Incompatible materials, dust generation, excess heat.
Incompatibilities with Other Materials: Strong oxidizing agents.
Hazardous Decomposition Products: Carbon monoxide, oxides of sulfur, carbon dioxide, hydrogen bromide.
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:
CAS# 76-59-5: SJ7450000
LD50/LC50:
Not available.

Carcinogenicity:
CAS# 76-59-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found
Teratogenicity: No information found
Reproductive Effects: No information found
Mutagenicity: No information found
Neurotoxicity: No information found
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not Regulated	Not Regulated
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 76-59-5 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 76-59-5 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

Not available.

Risk Phrases:**Safety Phrases:**

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 76-59-5: No information available.

Canada - DSL/NDSL

CAS# 76-59-5 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of Not controlled..

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Bromocresol Purple

ACC# 03333

Section 1 - Chemical Product and Company Identification

MSDS Name: Bromocresol Purple

Catalog Numbers: B393-5

Synonyms: 5',5'-Dibromo-o-cresol sulfophthalein

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
115-40-2	Bromocresol Purple	100	204-087-8

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: gray, purple, light or pale yellow solid.

Warning! Causes eye, skin, and respiratory tract irritation.

Target Organs: Respiratory system.

Potential Health Effects

Eye: Dust may cause mechanical irritation.

Skin: Dust may cause mechanical irritation. Low hazard for usual industrial handling.

Ingestion: Ingestion of large amounts may cause gastrointestinal irritation. Expected to be a low ingestion hazard.

Inhalation: May cause respiratory tract irritation. Low hazard for usual industrial handling.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media: In case of fire, use water, dry chemical, chemical foam, or alcohol-resistant foam. Water or foam may cause frothing.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container.

Section 7 - Handling and Storage

Handling: Use with adequate ventilation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation.

Storage: Keep away from heat, sparks, and flame. Store in a tightly closed container. Keep from contact with oxidizing materials. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate ventilation to keep airborne concentrations low.
Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Bromocresol Purple	none listed	none listed	none listed

OSHA Vacated PELs: Bromocresol Purple: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: gray, purple, light or pale yellow

Odor: odorless

pH: Not available.

Vapor Pressure: Negligible.

Vapor Density: Not available.

Evaporation Rate: Negligible.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 240 deg C

Decomposition Temperature: 240 deg C

Solubility: < 0.1%

Specific Gravity/Density: Not available.

Molecular Formula: C₂₁H₁₆Br₂O₅S

Molecular Weight: 539.977

Section 10 - Stability and Reactivity

Chemical Stability: Stable. However, may decompose if heated.

Conditions to Avoid: Incompatible materials, ignition sources, strong oxidants, temperatures above 140°C.

Incompatibilities with Other Materials: Strong oxidizing agents.

Hazardous Decomposition Products: Carbon monoxide, oxides of sulfur, carbon dioxide, hydrogen bromide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 115-40-2 unlisted.

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 115-40-2: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No data available.

Teratogenicity: No data available.

Reproductive Effects: No data available.

Mutagenicity: No data available.

Neurotoxicity: No data available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 115-40-2 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 115-40-2 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XI

Risk Phrases:

R 36/37/38 Irritating to eyes, respiratory system and skin.

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 37/39 Wear suitable gloves and eye/face protection.

WGK (Water Danger/Protection)

CAS# 115-40-2: No information available.

Canada - DSL/NDSL

CAS# 115-40-2 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Bromophenol Blue

ACC# 60130

Section 1 - Chemical Product and Company Identification

MSDS Name: Bromophenol Blue

Catalog Numbers: B392-5, BP115-25

Synonyms: Albutest; Bromphenol Blue; Tetrabromophenolsulfophthalein; 3', 3'', 5', 5''-Tetrabromophenolsulfoththalein

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
115-39-9	Bromphenol blue	ca 100	204-086-2

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: slight orange solid.

Caution! May cause eye and skin irritation. May cause respiratory and digestive tract irritation. This is expected to be a low hazard for usual industrial handling.

Target Organs: No data found.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. Low hazard for usual industrial handling. The toxicological properties of this substance have not been fully investigated.

Inhalation: May cause respiratory tract irritation. Low hazard for usual industrial handling. The toxicological properties of this substance have not been fully investigated.

Chronic: Allergic reactions have occurred with similar compounds.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. If irritation develops, get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists. Wash clothing before reuse.

Ingestion: Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water. Wash mouth out with water. Get medical aid if irritation or symptoms occur.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use agent most appropriate to extinguish fire. Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation. Use with adequate ventilation.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. No special precautions indicated.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Bromphenol blue	none listed	none listed	none listed

OSHA Vacated PELs: Bromphenol blue: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: slight orange

Odor: odorless

pH: Not available.

Vapor Pressure: Negligible.

Vapor Density: Not available.

Evaporation Rate: Negligible.

Viscosity: Not available.
Boiling Point: Not available.
Freezing/Melting Point:273 deg C
Decomposition Temperature:279 deg C
Solubility: Sparingly soluble in water.
Specific Gravity/Density:Not available.
Molecular Formula:C19H10Br4O5S
Molecular Weight:669.743

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Incompatible materials, dust generation, excess heat.
Incompatibilities with Other Materials: Strong oxidizing agents.
Hazardous Decomposition Products: Carbon monoxide, oxides of sulfur, irritating and toxic fumes and gases, carbon dioxide, hydrogen bromide.
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:
CAS# 115-39-9: SJ7453000
LD50/LC50:
Not available.

Carcinogenicity:
CAS# 115-39-9: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found
Teratogenicity: No information found
Reproductive Effects: No information found
Mutagenicity: No information found
Neurotoxicity: No information found
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 115-39-9 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.
None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 115-39-9 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

WGK (Water Danger/Protection)

CAS# 115-39-9: No information available.

Canada - DSL/NDSL

CAS# 115-39-9 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of Not controlled..

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Brucine Sulfate Heptahydrate

ACC# 76326

Section 1 - Chemical Product and Company Identification

MSDS Name: Brucine Sulfate Heptahydrate

Catalog Numbers: B391-25, B391I 25, B391I-25, B391I25

Synonyms: 2,3-Dimethoxystrychnidin-10-one Sulfate, Heptahydrate; Strychnidin-10-one, 2,3-Dimethoxy-, Sulfate (1:1), Heptahydrate

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
5787-00-8	Brucine Sulfate Heptahydrate	100.0	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid.

Danger! May be fatal if swallowed. Poison! May cause eye and skin irritation. May cause respiratory and digestive tract irritation. May cause central nervous system effects. May cause blurred vision.

Target Organs: Central nervous system.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation.

Ingestion: May cause irritation of the digestive tract. Poison by ingestion. May cause tremors and convulsions.

Inhalation: May cause effects similar to those described for ingestion. May cause respiratory tract irritation.

Chronic: Not available.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. SPEED IS ESSENTIAL. A DOCTOR MUST BE NOTIFIED AT ONCE.

Inhalation: Get medical aid immediately. Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

Notes to Physician: Brucine is very similar to strychnine.

Section 5 - Fire Fighting Measures

General Information: Evacuate area and fight fire from a safe distance. As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media: Use water spray, dry chemical, or carbon dioxide.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 3; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Wash hands before eating. Remove

contaminated clothing and wash before reuse. Use only in a well-ventilated area. Avoid contact with skin and eyes. Do not ingest or inhale.

Storage: Store in a cool, dry place.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use process enclosure, local exhaust ventilation, or other engineering controls to control airborne levels.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Brucine Sulfate Heptahydrate	none listed	none listed	none listed

OSHA Vacated PELs: Brucine Sulfate Heptahydrate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white

Odor: none reported

pH: Not available.

Vapor Pressure: Negligible

Vapor Density: Not available.

Evaporation Rate: Negligible

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: Not available.

Decomposition Temperature: Not available.

Solubility: Slightly soluble in water

Specific Gravity/Density: Not available.

Molecular Formula: (C₂₃H₂₆N₂O₄)₂H₂SO₄·7H₂O

Molecular Weight: 1012.5514

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions.

Conditions to Avoid: None reported.

Incompatibilities with Other Materials: Oxidizers

Hazardous Decomposition Products: Carbon monoxide, oxides of nitrogen, oxides of sulfur, carbon dioxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 5787-00-8 unlisted.

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 5787-00-8: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No data available.

Teratogenicity: No data available.

Reproductive Effects: No data available.

Mutagenicity: No data available.

Neurotoxicity: No data available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	BRUCINE	TOXIC SOLID ORGANIC NOS (BRUCINE SULFATE)
Hazard Class:	6.1	6.1
UN Number:	UN1570	UN2811
Packing Group:	I	II

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 5787-00-8 is not on the TSCA Inventory because it is a hydrate. It is considered to be listed if the CAS number for the anhydrous form is on the inventory (40CFR720.3(u)(2)).

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 5787-00-8: immediate.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 5787-00-8 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

Not available.

Risk Phrases:**Safety Phrases:****WGK (Water Danger/Protection)**

CAS# 5787-00-8: No information available.

Canada - DSL/NDSL

None of the chemicals in this product are listed on the DSL or NDSL list.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

EM SCIENCE -- CX0012, CADMIUM METAL -- 6810-00N031390

=====
===== Product Identification =====

Product ID: CX0012, CADMIUM METAL
MSDS Date: 01/21/1987
FSC: 6810
NIIN: 00N031390
MSDS Number: BPLHT
=== Responsible Party ===
Company Name: EM SCIENCE
Address: 111 WOODCREST RD
City: CHERRY HILL
State: NJ
ZIP: 08034-0395
Country: US
Info Phone Num: 609-354-9200
Emergency Phone Num: 609-354-9200
CAGE: DO242

==== Contractor Identification ====

Company Name: E M SCIENCE DIV OF E M INDUSTRIES INC
Address: 480 DEMOCRAT ROAD
Box: 70
City: GIBBSTOWN
State: NJ
ZIP: 08027
Country: US
Phone: 800-222-0342/609-423-6300
CAGE: 63612
Company Name: EM SCIENCE
Address: 480 DEMOCRAT RD
City: GIBBSTOWN
State: NJ
ZIP: 08927
Phone: 800-424-9300 (CHEMTREC)
CAGE: DO242

=====
===== Composition/Information on Ingredients =====

Inged Name: CADMIUM (SARA III)
CAS: 7440-43-9
RTECS #: EU9800000
OSHA PEL: SEE 1910.1027
ACGIH TLV: 0.01 MG/M3 DUST; 9394
EPA Rpt Qty: 10 LBS
DOT Rpt Qty: 10 LBS

=====
===== Hazards Identification =====

LD50 LC50 Mixture: NONE SPECIFIED BY MANUFACTURER.
Routes of Entry: Inhalation: YES Skin: NO Ingestion: YES
Reports of Carcinogenicity: NTP: YES IARC: YES OSHA: NO
Health Hazards Acute and Chronic: ACUTE: INHALATION OF DUST OR FUME CAN CAUSE SEVERE LUNG IRRITATION AND PULMONARY EDEMA, WHICH MAY BE FATAL. INGESTION CAUSES SEVERE GASTROINTESTINAL IRRITATION. CONTACT WITH SKIN OR EYES MAY CAUSE IRRITATION. MEDICAL SURVEILLANCE OF PERSONNEL CONTINUALLY EXPOSED (EFTS OF OVEREXP)

Explanation of Carcinogenicity:CADMIUM:GROUP 2A (IARC); ANTICIPATED TO BE CARCINOGEN.

Effects of Overexposure:HLTH HAZ:TO CADMIUM DUST OR FUMES IS RECOMMENDED. CHRONIC:TESTS ON LAB ANIMALS INDICATE MATERIAL MAY PRODUCE ADVERSE REPRODUCTIVE EFFECTS. CHRONIC EXPOSURE CAN ALSO CAUSE KIDNEY DAMAGE.

Medical Cond Aggravated by Exposure:NONE SPECIFIED BY MANUFACTURER.

=====
===== First Aid Measures =====

First Aid:GET MEDICAL ASSISTANCE FOR ALL CASES OF OVEREXPOSURE.
SKIN:WASH THOROUGHLY WITH SOAP AND WATER. EYES:IMMEDIATELY FLUSH THOROUGHLY WITH LARGE AMOUNTS OF WATER FOR AT LEAST 15 MINUTES.
INHAL:REMOVE TO FRESH AIR; GIVE ARTIFICIAL RESPIRATION IF BREATHING HAS STOPPED. INGEST:IF CONSCIOUS, INDUCE VOMITING.

=====
===== Fire Fighting Measures =====

Flash Point:NONE
Extinguishing Media:CARBON DIOXIDE, DRY CHEMICAL.
Fire Fighting Procedures:USE NIOSH/MSHA APPROVED SCBA AND FULL PROTECTIVE EQUIPMENT .
Unusual Fire/Explosion Hazard:CADMIUM DUST IS A MODERATE FIRE AND EXPLOSION HAZARD.

=====
===== Accidental Release Measures =====

Spill Release Procedures:TAKE UP AND CONTAINERIZE FOR PROPER DISPOSAL.
Neutralizing Agent:NONE SPECIFIED BY MANUFACTURER.

=====
===== Handling and Storage =====

Handling and Storage Precautions:KEEP CONTAINER CLOSED. STORE IN A COOL AREA AWAY FROM IGNITION SOURCES AND OXIDIZERS. DO NOT BREATHE DUST OR FUMES.
Other Precautions:DO NOT GET IN EYES. AVOID PROLONGED OR REPEATED SKIN CONTACT. DO NOT TAKE INTERNALLY.

=====
===== Exposure Controls/Personal Protection =====

Respiratory Protection:NIOSH/MSHA APPROVED RESPIRATOR SHOULD BE WORN IN THE ABSENCE OF ADEQUATE VENTILATION.
Ventilation:MATERIAL MUST BE HANDLED OR TRANSFERRED IN AN APPROVED HOOD OR WITH ADEQUATE VENTILATION.
Protective Gloves:NEOPRENE, NATURAL RUBBER, PVC (SUPDAT)
Eye Protection:CHEMICAL WORKERS GOGGLES .
Other Protective Equipment:NONE SPECIFIED BY MANUFACTURER.
Work Hygienic Practices:WASH THOROUGHLY AFTER HANDLING.
Supplemental Safety and Health
PROT GLOVES:OR EQUIVALENT GLOVES SHOULD BE WORN TO PREVENT SKIN CONTACT.

=====
===== Physical/Chemical Properties =====

HCC:N1
Boiling Pt:B.P. Text:1413F,767C
Melt/Freeze Pt:M.P/F.P Text:610F,321C

Spec Gravity:8.642 (H2O =1)
Solubility in Water:INSOLUBLE
Appearance and Odor:GRAY POWDER, GRANULES, METALLIC RODS OR PIECES.

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES
HYDRAZOIC ACID, TE, SE, S, ZN.
Stability Condition to Avoid:DUSTING; CONTACT OF DUST WITH IGNITION SOURCES.
Hazardous Decomposition Products:NONE; FORMS CADMIUM OXIDE AS A COMBUSTION PRODUCT.

===== Disposal Considerations =====

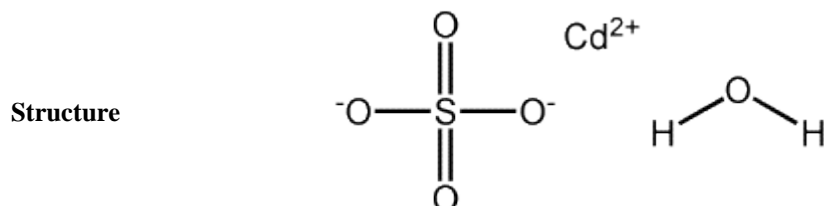
Waste Disposal Methods:TO BE PERFORMED INCOMPLIANCE WITH ALL CURRENT LOCAL, STATE AND FEDERAL REGULATIONS.

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Cadmium sulfate, hydrate

- Cadmium mesosulfate
- Cadmium sulfate monohydrate
- Sulfuric acid, cadmium salt (1:1), monohydrate

Formula CdSO₄.H₂O



Description White solid.

Uses Used in industries for the electroplating of cadmium in electronic circuits.

Registry Numbers and Inventories.

CAS	13477-20-8
NIH PubChem CID	24962
RTECS	EV2800000
RTECS class	Tumorigen; Reproductive Effector
UN (DOT)	2570
Beilstein/Gmelin	232588 (G)

Properties.

Formula	CdH ₂ O ₅ S
Formula mass	334.60
Density	3.786 g/cm ³
Solubility in water	499 g/L (40 C)

Hazards and Protection.

Storage	Keep in a cool, dry, dark location in a tightly sealed container or cylinder. Keep away from incompatible materials, ignition sources and untrained individuals. Secure and label area. Protect containers/cylinders from physical damage.
Handling	All chemicals should be considered hazardous. Avoid direct physical contact. Use appropriate, approved safety equipment. Untrained individuals should not handle this chemical or its container. Handling should occur in a chemical fume hood.
Protection	Wear appropriate protective gloves, clothing and goggles.

Respirators	Wear positive pressure self-contained breathing apparatus (SCBA).
Small spills/leaks	ELIMINATE all ignition sources. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Stop leak if you can do it without risk. Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers. DO NOT GET WATER INSIDE CONTAINERS.
Stability	No data.

Fire.

Fire fighting	Extinguish using agent most appropriate for surrounding fire.
Fire potential	Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes.
Hazards	Contact with metals may evolve flammable hydrogen gas.
Combustion products	Fire may produce irritating, corrosive and/or toxic gases.

Health.

Exposure limit(s)	5 ug/m3 PEL { 2 ug/m3 respirable TLV }
Carcinogen	O, G-A2, I-1, N-1, CP65
Exposure effects	
Ingestion	See Inhalation.
Inhalation	TOXIC; inhalation, ingestion, or skin contact with material may cause severe injury or death. Effects of contact or inhalation may be delayed.
Skin	Contact with molten substance may cause severe burns to skin and eyes. See Inhalation.
Eyes	See Inhalation.
First aid	
Ingestion	Seek medical assistance.
Inhalation	Move victim to fresh air. Apply artificial respiration if victim is not breathing. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Administer oxygen if breathing is difficult.
Skin	Remove and isolate contaminated clothing and shoes. Immediately flush with running water for at least 20 minutes. For minor skin contact, avoid spreading material on unaffected skin.
Eyes	Immediately flush with running water for at least 20 minutes.

Transportation.

UN number 2570



Response guide [154](#)

Hazard class 6.1

Packing Group I; II; III

USCG CHRIS Code CDY

Material Safety Data Sheet

Calcium sulfate, anhydrous, 99%

ACC# 97063

Section 1 - Chemical Product and Company Identification

MSDS Name: Calcium sulfate, anhydrous, 99%

Catalog Numbers: AC217520000, AC217521000, AC217525000

Synonyms: Crysalba; Drierite; Thiolite

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7778-18-9	Calcium sulfate, anhydrous	99	231-900-3

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: colorless to white powder.

Warning! Causes eye and respiratory tract irritation. May cause skin irritation.

Hygroscopic (absorbs moisture from the air).

Target Organs: Respiratory system, eyes.

Potential Health Effects

Eye: Causes eye irritation.

Skin: May cause skin irritation.

Ingestion: May cause digestive tract disturbances.

Inhalation: Causes respiratory tract irritation. Inhalation of dusts may cause nervous system complaints, ulceration of the mucous membranes of the nose and throat, epistaxis, headache, irritation and nervousness.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up or absorb material, then place into a suitable clean, dry, closed container for disposal. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use only in a well-ventilated area. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation.

Storage: Keep container closed when not in use. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep containers tightly closed.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Calcium sulfate, anhydrous	10 mg/m ³ TWA (inhalable fraction)	10 mg/m ³ TWA (total dust); 5 mg/m ³ TWA (respirable dust)	15 mg/m ³ TWA (total dust); 5 mg/m ³ TWA (respirable fraction)

OSHA Vacated PELs: Calcium sulfate, anhydrous: 15 mg/m³ TWA; 5 mg/m³ TWA (respirable fraction)

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Powder

Appearance: colorless to white

Odor: odorless

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: 4.69

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 1450 deg C

Decomposition Temperature: Not available.

Solubility: slightly soluble

Specific Gravity/Density: 2.9600g/cm³

Molecular Formula: CaO₄S

Molecular Weight: 136.14

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, moisture, strong oxidants.

Incompatibilities with Other Materials: Strong oxidizing agents.

Hazardous Decomposition Products: Oxides of sulfur, oxides of sulfur.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 7778-18-9: WS6920000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 7778-18-9: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No data available.

Teratogenicity: No data available.

Reproductive Effects: No data available.

Mutagenicity: No data available.

Neurotoxicity: No data available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7778-18-9 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313

No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7778-18-9 can be found on the following state right to know lists: New Jersey, Pennsylvania, Minnesota, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XI

Risk Phrases:

R 36/37 Irritating to eyes and respiratory system.

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 36/37 Wear suitable protective clothing and gloves.

WGK (Water Danger/Protection)

CAS# 7778-18-9: 0

Canada - DSL/NDSL

CAS# 7778-18-9 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Calcium Acetate Monohydrate

ACC# 03845

Section 1 - Chemical Product and Company Identification

MSDS Name: Calcium Acetate Monohydrate

Catalog Numbers: C46-500, NC9859398

Synonyms: Calcium diacetate; acetic acid calcium salt

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
5743-26-0	Calcium acetate, monohydrate	100	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid.

Caution! May cause eye, skin, and respiratory tract irritation. Hygroscopic (absorbs moisture from the air).

Target Organs: No data found.

Potential Health Effects

Eye: Dust may cause mechanical irritation.

Skin: May cause skin irritation. Low hazard for usual industrial handling.

Ingestion: Ingestion of large amounts may cause gastrointestinal irritation.

Inhalation: May cause respiratory tract irritation. Low hazard for usual industrial handling.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Get medical aid if irritation or symptoms occur.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions.

Section 7 - Handling and Storage

Handling: Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion

and inhalation.

Storage: Keep from contact with oxidizing materials. Store in a cool, dry, well-ventilated area away from incompatible substances. Store protected from moisture.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Calcium acetate, monohydrate	none listed	none listed	none listed

OSHA Vacated PELs: Calcium acetate, monohydrate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white

Odor: odorless

pH: 7.6 (0.2M Solution)

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 160 deg C

Decomposition Temperature: 160 deg C

Solubility: 44% at 0°C

Specific Gravity/Density: 1.50 (Water=1)

Molecular Formula:CaC4H6O4.1H2O

Molecular Weight:176.13

Section 10 - Stability and Reactivity

Chemical Stability: Stable.

Conditions to Avoid: Strong oxidants, exposure to moist air or water.

Incompatibilities with Other Materials: Strong oxidizing agents, moisture.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 5743-26-0: AF7875000

LD50/LC50:

CAS# 5743-26-0:

Oral, rat: LD50 = 4280 mg/kg;

Carcinogenicity:

CAS# 5743-26-0: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. This chemical is expected to have a high biological oxygen demand and may cause oxygen depletion in aquatic systems. It is expected to have a low potential to affect aquatic organisms, and secondary waste treatment microorganisms.

Environmental: No information available.

Physical: No information available.

Other: No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 5743-26-0 is not on the TSCA Inventory because it is a hydrate. It is considered to be listed if the CAS number for the anhydrous form is on the inventory (40CFR720.3(u)(2)).

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 5743-26-0 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

WGK (Water Danger/Protection)

CAS# 5743-26-0: No information available.

Canada - DSL/NDSL

None of the chemicals in this product are listed on the DSL or NDSL list.

Canada - WHMIS

This product has a WHMIS classification of Not controlled.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Calcium carbonate

ACC# 03880

Section 1 - Chemical Product and Company Identification

MSDS Name: Calcium carbonate

Catalog Numbers: AC124670000, AC124670010, AC124670025, AC219160000, AC219160010, AC219160025, AC219165000, AC403790000, AC403790020, AC403790030, AC403800000, AC403805000, AC403810000, AC403811000, AC403815000, AC423510000, AC423511000, AC423515000, C63-10, C63-3, C64-3, C64-500

Synonyms: Precipitated chalk; Aragonite; Agricultural limestone; Agstone; Bell mine pulverized limestone; Calcite; Dolomite; Franklin; Boiling chips.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
471-34-1	Calcium carbonate	97-100	207-439-9

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid.

Warning! Causes eye irritation. May cause skin and respiratory tract irritation.

Target Organs: Eyes.

Potential Health Effects

Eye: Causes eye irritation.

Skin: May cause skin irritation.

Ingestion: Ingestion of large amounts may cause gastrointestinal irritation. Expected to be

a low ingestion hazard.

Inhalation: Low hazard for usual industrial handling. Excessive inhalation may cause minor respiratory irritation.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or chemical foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions.

Section 7 - Handling and Storage

Handling: Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid breathing dust.

Storage: Store in a cool, dry place. Store in a tightly closed container.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Calcium carbonate	none listed	10 mg/m ³ TWA (total dust); 5 mg/m ³ TWA (respirable dust)	15 mg/m ³ TWA (total dust); 5 mg/m ³ TWA (respirable fraction) (listed under Calcium carbonate).

OSHA Vacated PELs: Calcium carbonate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white

Odor: odorless

pH: 8-9 (solution)

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 825 deg C

Decomposition Temperature: 825 deg C

Solubility: Slightly soluble in water.

Specific Gravity/Density: 2.7-2.9

Molecular Formula: CaCO₃

Molecular Weight: 100.09

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Dust generation, moisture.

Incompatibilities with Other Materials: Strong oxidizing agents, acids, aluminum, magnesium, fluorine.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide, calcium oxide.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 471-34-1: FF9335000

LD50/LC50:

CAS# 471-34-1:

Draize test, rabbit, eye: 750 ug/24H Severe;

Draize test, rabbit, skin: 500 mg/24H Moderate;

Oral, rat: LD50 = 6450 mg/kg;

Carcinogenicity:

CAS# 471-34-1: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. This chemical is expected to cause no oxygen depletion in aquatic systems. It has a low potential to affect aquatic organisms. Acute aquatic effects: 48-hour LC50; Mosquito fish: 56,000 mg/L.

Environmental: This chemical released into the environment will not have a significant

impact.

Physical: No information available.

Other: Do not empty into drains.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not Regulated.	Not Regulated.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 471-34-1 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 471-34-1: immediate.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 471-34-1 can be found on the following state right to know lists: Pennsylvania, (listed as Calcium carbonate), Minnesota, (listed as Calcium carbonate), Massachusetts, (listed as Calcium carbonate).

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

XI

Risk Phrases:

R 36 Irritating to eyes.

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 39 Wear eye/face protection.

WGK (Water Danger/Protection)

CAS# 471-34-1: 0

Canada - DSL/NDSL

CAS# 471-34-1 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 471-34-1 is not listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Calcium Chloride, Anhydrous Powder, 96%

ACC# 02729

Section 1 - Chemical Product and Company Identification

MSDS Name: Calcium Chloride, Anhydrous Powder, 96%

Catalog Numbers: AC349610000, AC349610250, AC349615000, NC9297837, XXAC34961-80KG

Synonyms: Calpus; Caltac; Dowflake; Liquidow; Peladow; Snowmelt; Superflake Anhydrous.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
10043-52-4	Calcium Chloride	96%	233-140-8

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white powder.

Warning! May be harmful if swallowed. May cause severe respiratory and digestive tract irritation with possible burns. May cause severe eye and skin irritation with possible burns. May cause cardiac disturbances. Hygroscopic (absorbs moisture from the air).

Target Organs: Heart.

Potential Health Effects

Eye: Contact with eyes may cause severe irritation, and possible eye burns.

Skin: Contact with skin causes irritation and possible burns, especially if the skin is wet or moist.

Ingestion: May cause severe gastrointestinal tract irritation with nausea, vomiting and possible burns. May cause cardiac disturbances. May be harmful if swallowed. In very severe cases, seizures, rapid respiration, slow heartbeat, or death, may

Inhalation: May cause severe irritation of the upper respiratory tract with pain, burns, and inflammation.

Chronic: Effects may be delayed.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid. Do NOT use mouth-to-mouth resuscitation.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: Wear appropriate protective clothing to prevent contact with skin and eyes. Wear a self-contained breathing apparatus (SCBA) to prevent contact with thermal decomposition products.

Extinguishing Media: Use extinguishing media most appropriate for the surrounding fire.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container.

Clean up spills immediately, observing precautions in the Protective Equipment section.

Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Minimize dust generation and accumulation. Keep container tightly closed. Do not get on skin or in eyes. Do not ingest or inhale. Wash clothing before reuse. Always use cool water when dissolving calcium chloride. Heat evolved is significant.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Store protected from moisture. Store below melting point.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Calcium Chloride	none listed	none listed	none listed

OSHA Vacated PELs: Calcium Chloride: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear impervious gloves.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Powder

Appearance: white

Odor: odorless

pH: 8-10 100 g/l aq.sol.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.
Boiling Point: > 1600 deg C @ 760.0
Freezing/Melting Point:782 deg C
Decomposition Temperature:Not available.
Solubility: 740 g/l water (20°C)
Specific Gravity/Density:Not available.
Molecular Formula:CaCl₂
Molecular Weight:110.99

Section 10 - Stability and Reactivity

Chemical Stability: Stable.
Conditions to Avoid: Dust generation, excess heat, exposure to moist air or water.
Incompatibilities with Other Materials: Bromine trifluoride, 2-Furanpercarboxylic Acid, Solutions attack some metals..
Hazardous Decomposition Products: Hydrogen chloride, calcium oxide.
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:
CAS# 10043-52-4: EV9800000
LD50/LC50:
CAS# 10043-52-4:
Oral, mouse: LD50 = 1940 mg/kg;
Oral, rabbit: LD50 = 1384 mg/kg;
Oral, rat: LD50 = 1 gm/kg; <BR.

Carcinogenicity:
CAS# 10043-52-4: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found.
Teratogenicity: No information found.
Reproductive Effects: No information found.
Mutagenicity: Mutagenic effects have occurred in experimental animals.
Neurotoxicity: No information found.
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	NOT REGULATED FOR DOMESTIC TRANSPORT	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 10043-52-4 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 10043-52-4: acute, chronic, reactive.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 10043-52-4 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XI

Risk Phrases:

R 36 Irritating to eyes.

Safety Phrases:

S 22 Do not breathe dust.

S 24 Avoid contact with skin.

WGK (Water Danger/Protection)

CAS# 10043-52-4: 0

Canada - DSL/NDSL

CAS# 10043-52-4 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Calcium Hydroxide

ACC# 03980

Section 1 - Chemical Product and Company Identification

MSDS Name: Calcium Hydroxide

Catalog Numbers: AC219180000, AC219180010, AC219180025, AC219180050, AC219181000, AC219185000, AC385610000, AC385890000, AC403850000, AC403850010, AC403850050, C88-500, C97-10, C97-3, C97-500, C9710LC, C9750

Synonyms: Biocalc; Calcium hydrate; Calcium dihydrate; Carboxide; Calcium dihydroxide; Caustic lime; Hydrated lime; Slaked lime; Kalkhydrate; Lime water; Lime milk

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
1305-62-0	Calcium hydroxide	>95	215-137-3

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: colorless solid.

Danger! Eye contact may result in permanent eye damage. Causes eye burns. Causes severe skin irritation. May cause severe respiratory and digestive tract irritation with possible burns.

Target Organs: Respiratory system, eyes, skin.

Potential Health Effects

Eye: Causes eye burns. May result in corneal injury. May cause permanent visual impairment.

Skin: May cause skin sensitization, an allergic reaction, which becomes evident upon re-exposure to this material. May be harmful if absorbed through the skin.

Ingestion: May cause irritation of the digestive tract. Causes severe pain, nausea, vomiting, diarrhea, and shock. May be harmful if swallowed.

Inhalation: Causes respiratory tract irritation. May cause chemical bronchitis with coughing and difficulty in breathing.

Chronic: Prolonged or repeated skin contact may cause dermatitis. Chronic inhalation and ingestion may cause effects similar to those of acute inhalation and ingestion.

Section 4 - First Aid Measures

Eyes: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical aid immediately.

Skin: In case of contact, immediately flush skin with plenty of water. Remove contaminated clothing and shoes. Get medical aid. Wash clothing before reuse.

Ingestion: If swallowed, do NOT induce vomiting. Get medical aid immediately. If victim is fully conscious, give a cupful of water. Never give anything by mouth to an unconscious person.

Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Substance is nonflammable.

Extinguishing Media: Use extinguishing media most appropriate for the surrounding fire.

Flash Point: Not applicable.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 3; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid breathing dust.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Calcium hydroxide	5 mg/m ³ TWA	5 mg/m ³ TWA	15 mg/m ³ TWA (total dust); 5 mg/m ³ TWA (respirable fraction)

OSHA Vacated PELs: Calcium hydroxide: 5 mg/m³ TWA (not in effect as a result of reconsideration)

Personal Protective Equipment

Eyes: Wear dust-proof goggles.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: colorless

Odor: odorless

pH: 12.4 (sat. sol.)

Vapor Pressure: 0 mm Hg

Vapor Density: Not available.

Evaporation Rate: Negligible.

Viscosity: Not applicable.
Boiling Point: Not available.
Freezing/Melting Point: 580 deg C
Decomposition Temperature: Not available.
Solubility: Slightly soluble.
Specific Gravity/Density: 2.24 (Water=1)
Molecular Formula: CaH₂O₂
Molecular Weight: 74.09

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions. Readily absorbs carbon dioxide from air forming calcium carbonate.
Conditions to Avoid: High temperatures, dust generation, prolonged exposure to air.
Incompatibilities with Other Materials: Acids, phosphorus, maleic anhydride, nitromethane, nitroethane, nitroparaffins, nitropropane, some metals.
Hazardous Decomposition Products: Calcium oxide.
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 1305-62-0: EW2800000

LD50/LC50:

CAS# 1305-62-0:

Draize test, rabbit, eye: 10 mg Severe;

Oral, mouse: LD50 = 7300 mg/kg;

Oral, rat: LD50 = 7340 mg/kg;

Carcinogenicity:

CAS# 1305-62-0: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: See actual entry in RTECS for complete information.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. Mosquito fish, TLm=240 ppm/24H, 220 ppm/48H, 160 ppm/96H at 21-23C.

Environmental: No information reported.

Physical: No information available.

Other: None.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	CORROSIVE SOLID, BASIC, INORGANIC, N.O.S. (Calcium hydroxide)	CORROSIVE SOLID BASIC INORGANIC (CALCIUM HYDROXIDE)
Hazard Class:	8	8
UN Number:	UN3262	UN3262
Packing Group:	III	III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 1305-62-0 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 1305-62-0: immediate.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 1305-62-0 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XI

Risk Phrases:

R 41 Risk of serious damage to eyes.

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 39 Wear eye/face protection.

WGK (Water Danger/Protection)

CAS# 1305-62-0: 1

Canada - DSL/NDSL

CAS# 1305-62-0 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of E.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 1305-62-0 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Calcium Hypochlorite

ACC# 88002

Section 1 - Chemical Product and Company Identification

MSDS Name: Calcium Hypochlorite

Catalog Numbers: AC199030010

Synonyms: Calcium oxychloride; losantin; Hypochlorous acid; Calcium salt; Lime chloride

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7778-54-3	Calcium hypochlorite	ca.100	231-908-7

Hazard Symbols: O C

Risk Phrases: 22 31 34 8

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white crystalline powder. **Danger!** Strong oxidizer. Contact with other material may cause a fire. Corrosive. Causes eye and skin burns. May be harmful if swallowed. May cause severe respiratory tract irritation with possible burns. May cause severe digestive tract irritation with possible burns.

Target Organs: None known.

Potential Health Effects

Eye: Causes eye burns. May result in corneal injury. May cause blepharitis (inflammation of the margins of the eyelids).

Skin: Causes severe burns with delayed tissue destruction.

Ingestion: May cause severe and permanent damage to the digestive tract. Causes gastrointestinal tract burns. May cause perforation of the digestive tract. May be harmful if swallowed.

Inhalation: Causes chemical burns to the respiratory tract. Aspiration may lead to

pulmonary edema. May cause systemic effects. Causes corrosive action on the mucous membranes.

Chronic: Prolonged or repeated skin contact may cause dermatitis. Prolonged or repeated eye contact may cause conjunctivitis. Effects may be delayed. Laboratory experiments have resulted in mutagenic effects.

Section 4 - First Aid Measures

Eyes: Get medical aid immediately. Do NOT allow victim to rub or keep eyes closed. Extensive irrigation with water is required (at least 30 minutes).

Skin: Get medical aid immediately. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Destroy contaminated shoes.

Ingestion: Do NOT induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation: Get medical aid immediately. Remove from exposure and move to fresh air immediately. If breathing is difficult, give oxygen. Do NOT use mouth-to-mouth resuscitation. If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Strong oxidizer. Contact with combustible materials may cause a fire. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Use water spray to keep fire-exposed containers cool. Use water with caution and in flooding amounts. Contaminating or mixing with foreign materials such as combustibles, grease, and fuels can cause fire. Containers may explode when heated.

Extinguishing Media: Use water spray to cool fire-exposed containers. Contact professional fire-fighters immediately. Cool containers with flooding quantities of water until well after fire is out. For small fires, do NOT use dry chemicals, carbon dioxide, halon or foams. USE WATER ONLY. For large fires, flood fire area with water from a distance.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 3; Flammability: 0; Instability: 1; Special Hazard: OX

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Remove all sources of ignition. Provide ventilation. Do not get water inside containers. Do not use combustible materials such as paper towels to clean up spill.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use only in a well-ventilated area. Minimize dust generation and accumulation. Do not get in eyes, on skin, or on clothing. Keep container tightly closed. Avoid contact with heat, sparks and flame. Avoid contact with clothing and other combustible materials. Do not ingest or inhale. Discard contaminated shoes.

Storage: Keep away from heat, sparks, and flame. Keep away from sources of ignition. Do not store near combustible materials. Keep container closed when not in use. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from acids.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Calcium hypochlorite	none listed	none listed	none listed

OSHA Vacated PELs: Calcium hypochlorite: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant a respirator's use.

Section 9 - Physical and Chemical Properties

Physical State: Crystalline powder

Appearance: white

Odor: strong odor - chlorine-like

pH: Not available.

Vapor Pressure: Not applicable.

Vapor Density: Not applicable.

Evaporation Rate: Not applicable.

Viscosity: Not available.

Boiling Point: Decomposes

Freezing/Melting Point: 100 deg C

Decomposition Temperature: 175 deg C

Solubility: Slightly soluble.

Specific Gravity/Density: 2.350

Molecular Formula: CaCl₂O₂

Molecular Weight: 142.9848

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions.

Conditions to Avoid: High temperatures, incompatible materials, ignition sources, dust generation, acids, excess heat, combustible materials, organic materials, reducing agents.

Incompatibilities with Other Materials: Reducing agents, carbontetrachloride, ammonia, aliphatic amines, aromatic amines, sulfur, sulfides (inorganic, e.g. ferric sulfide, lead sulfide, sodium sulfide), metal oxides, glycerol, phenols, diethylene glycol monomethyl ether, carbon, acetic acid + potassium, cyanides (e.g. potassium cyanide, sodium cyanide), ammonium chloride, charcoal, N,N-dichloromethylamine + heat, ethanol, menthol, iron oxide, rust, 1-propanethiol, isobutanethiol, turpentine, sodium hydrogen sulfate + starch + sodium carbonate, acetylene, hydroxy compounds (e.g. ethanol, ethylene glycol, glycerol, sugar), combustible materials (e.g. anthracene, grease, oil, mercaptans, methyl carbitol, nitromethane, organic matter, and propylmercaptan).

Hazardous Decomposition Products: Hydrogen chloride, irritating and toxic fumes and gases, oxygen, chlorine.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 7778-54-3: NH3485000

LD50/LC50:

CAS# 7778-54-3:

Oral, rat: LD50 = 850 mg/kg; <BR.

Carcinogenicity:

CAS# 7778-54-3: Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA.

Epidemiology: No information available.**Teratogenicity:** No information available.**Reproductive Effects:** No information available.**Neurotoxicity:** No information available.**Mutagenicity:** Mutation in Microorganisms: Salmonella typhimurium = 1 mg/plate.;

Cytogenetic Analysis: Hamster, Fibroblast = 4 gm/L.

Other Studies: No data available.

Section 12 - Ecological Information

Ecotoxicity: Fish: Striped bass: LC50 = 0.5 mg/L; 24 Hr; Static bioassay (70% hypochlorite)

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.**RCRA U-Series:** None listed.

Section 14 - Transport Information

	US DOT	IATA	RID/ADR	IMO	Canada TDG
Shipping Name:	CALCIUM HYPOCHLORITE, DRY				No information available.
Hazard Class:	5.1				
UN Number:	UN1748				
Packing Group:	II				

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7778-54-3 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

SARA

CERCLA Hazardous Substances and corresponding RQs

CAS# 7778-54-3: 10 lb final RQ; 4.54 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

SARA Codes

CAS # 7778-54-3: acute, flammable.

Section 313

No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants. This material does not contain any Class 1 Ozone depleters. This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

CAS# 7778-54-3 is listed as a Hazardous Substance under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7778-54-3 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Massachusetts.

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

O C

Risk Phrases:

R 22 Harmful if swallowed.

R 31 Contact with acids liberates toxic gas.

R 34 Causes burns.

R 8 Contact with combustible material may cause fire.

Safety Phrases:

S 1/2 Keep locked up and out of reach of children.

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 43J In case of fire, use water. Do not use dry chemicals or foams. CO2 or Halon may provide limited control.

WGK (Water Danger/Protection)

CAS# 7778-54-3: 2

Canada - DSL/NDSL

CAS# 7778-54-3 is listed on Canada's DSL List.

Canada - WHMIS

WHMIS: Not available.

**Canadian Ingredient Disclosure List
Exposure Limits**

Material Safety Data Sheet

Calcium nitrate tetrahydrate

ACC# 04020

Section 1 - Chemical Product and Company Identification

MSDS Name: Calcium nitrate tetrahydrate

Catalog Numbers: AC217510000, AC217510010, AC423530000, AC423530250, AC423535000, C108-3, C109-3, C109-500, NC9529337

Synonyms: Nitric acid, calcium salt, tetrahydrate; Norwegian saltpeter tetrahydrate; Calcium dinitrate tetrahydrate; Lime nitrate tetrahydrate; Nitrocalcite tetrahydrate; Lime saltpeter tetrahydrate.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
13477-34-4	Calcium nitrate tetrahydrate	>99	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white crystals.

Danger! Strong oxidizer. Contact with other material may cause a fire. Causes eye irritation. May cause skin and respiratory tract irritation. May cause methemoglobinemia. Hygroscopic (absorbs moisture from the air).

Target Organs: Blood, eyes.

Potential Health Effects

Eye: Causes eye irritation.

Skin: May cause skin irritation.

Ingestion: May cause digestive tract disturbances. Ingestion of nitrate containing compounds can lead to methemoglobinemia.

Inhalation: May cause respiratory tract irritation. May cause methemoglobinemia. The toxicity of nitrates is due to their in-vivo conversion to nitrites which may lead to methemoglobinemia.

Chronic: May cause methemoglobinemia, which is characterized by chocolate-brown colored blood, headache, weakness, dizziness, breath shortness, cyanosis (bluish skin due to deficient oxygenation of blood), rapid heart rate, unconsciousness and possible death.

Section 4 - First Aid Measures

Eyes: In case of contact, immediately flush eyes with plenty of water for a t least 15 minutes. Get medical aid.

Skin: In case of contact, flush skin with plenty of water. Remove contaminated clothing and shoes. Get medical aid if irritation develops and persists. Wash clothing before reuse.

Ingestion: If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: For methemoglobinemia, administer oxygen alone or with Methylene Blue depending on the methemoglobin concentration in the blood.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Strong oxidizer. Contact with other material may cause fire. Containers may explode in the heat of a fire. May decompose explosively when heated or involved in a fire. May accelerate burning if involved in a fire.

Extinguishing Media: Cool containers with flooding quantities of water until well after fire is out. For small fires, do NOT use dry chemicals, carbon dioxide, halon or foams. USE WATER ONLY. For large fires flood fire with water from a distance.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower:Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 1; Special Hazard: OX

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation. Keep combustibles (wood, paper, oil, etc.) away from spilled material.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Avoid contact with eyes, skin, and clothing. Keep from contact with clothing and other combustible materials. Avoid breathing dust. Inform laundry personnel of contaminant's hazards.

Storage: Do not store near combustible materials. Keep away from reducing agents. Keep containers tightly closed. Avoid storage on wood floors.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Calcium nitrate tetrahydrate	none listed	none listed	none listed
Calcium nitrate anhydrous	none listed	none listed	none listed

OSHA Vacated PELs: Calcium nitrate tetrahydrate: No OSHA Vacated PELs are listed for this chemical. Calcium nitrate anhydrous: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Crystals
Appearance: white
Odor: odorless
pH: Not available.
Vapor Pressure: Negligible.
Vapor Density: Not applicable.
Evaporation Rate: Negligible.
Viscosity: Not available.
Boiling Point: Not available.
Freezing/Melting Point: 45 deg C
Decomposition Temperature: 132 deg C
Solubility: Soluble.
Specific Gravity/Density: 1.82
Molecular Formula: Ca(NO₃)₂·4H₂O
Molecular Weight: 236.15

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions. Deliquescent (tending to absorb atmospheric water vapor and become liquid).
Conditions to Avoid: Mechanical shock, dust generation, moisture, excess heat.
Incompatibilities with Other Materials: Strong reducing agents, ammonia, finely powdered metals, hydrazine, organic materials, combustible materials.
Hazardous Decomposition Products: Oxides of nitrogen, calcium oxide.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 13477-34-4: EW3000000
CAS# 10124-37-5: EW2985000
LD50/LC50:
CAS# 13477-34-4:
Draize test, rabbit, eye: 500 mg/24H Mild;
Draize test, rabbit, skin: 500 mg/24H Mild;
Oral, rat: LD50 = 3900 mg/kg;
.
CAS# 10124-37-5:
Oral, rat: LD50 = 302 mg/kg;
.

Carcinogenicity:

CAS# 13477-34-4: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 10124-37-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: No information available.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	CALCIUM NITRATE	CALCIUM NITRATE
Hazard Class:	5.1	5.1
UN Number:	UN1454	UN1454
Packing Group:	III	III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 13477-34-4 is not on the TSCA Inventory because it is a hydrate. It is considered to be listed if the CAS number for the anhydrous form is on the inventory (40CFR720.3(u)(2)).

CAS# 10124-37-5 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 13477-34-4: immediate, fire.

CAS # 10124-37-5: immediate, fire.

Section 313

This material contains Calcium nitrate tetrahydrate (listed as Water Dissociable Nitrate Compounds), >99%, (CAS# 13477-34-4) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR

This material contains Calcium nitrate anhydrous (listed as Water Dissociable Nitrate Compounds), -%, (CAS# 10124-37-5) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 13477-34-4 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

CAS# 10124-37-5 can be found on the following state right to know lists: New Jersey.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XI O

Risk Phrases:

R 36 Irritating to eyes.

R 8 Contact with combustible material may cause fire.

Safety Phrases:

S 17 Keep away from combustible material.

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

WGK (Water Danger/Protection)

CAS# 13477-34-4: 1

CAS# 10124-37-5: 1

Canada - DSL/NDSL

CAS# 10124-37-5 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of C, D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 13477-34-4 is not listed on the Canadian Ingredient Disclosure List.

CAS# 10124-37-5 is not listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Calcium oxalate monohydrate, 98%

ACC# 80705

Section 1 - Chemical Product and Company Identification

MSDS Name: Calcium oxalate monohydrate, 98%

Catalog Numbers: AC403880000, AC403880050, AC403885000

Synonyms: Ethanedioic acid; calcium salt, monohydrate.

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
5794-28-5	Calcium oxalate, monohydrate	98	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white crystalline powder.

Warning! Harmful if swallowed. Causes eye, skin, and respiratory tract irritation. May cause kidney damage. Hygroscopic (absorbs moisture from the air).

Target Organs: Kidneys, respiratory system, eyes, skin.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Causes skin irritation. Oxalate is an irritant and may cause dermatitis. Skin lesions begin with epithelial cracking and the formation of slow-healing ulcers. The fingers may appear cyanotic.

Ingestion: Harmful if swallowed. May cause irritation of the digestive tract. May cause kidney damage. Mean lethal dose for oxalates in adults is estimated at 10 - 30 grams (143 - 428 mg/kg).

Inhalation: Causes respiratory tract irritation.

Chronic: May cause kidney injury.

Section 4 - First Aid Measures

Eyes: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical aid.

Skin: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid immediately. Wash clothing before reuse.

Ingestion: If swallowed, do NOT induce vomiting. Get medical aid immediately. If victim is fully conscious, give a cupful of water. Never give anything by mouth to an unconscious person.

Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Use water spray to keep fire-exposed containers cool.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 1; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before

reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Keep container closed when not in use. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Store protected from moisture. Oxalates slowly corrode steel.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Calcium oxalate, monohydrate	none listed	none listed	none listed
Ethanedioic acid, calcium salt (1:1)	none listed	none listed	none listed

OSHA Vacated PELs: Calcium oxalate, monohydrate: No OSHA Vacated PELs are listed for this chemical. Ethanedioic acid, calcium salt (1:1): No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Crystalline powder

Appearance: white

Odor: odorless

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.
Freezing/Melting Point: 200 deg C
Decomposition Temperature: Not available.
Solubility: Insoluble.
Specific Gravity/Density: 2.2
Molecular Formula: C₂CaO₄H₂O
Molecular Weight: 146.11

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Dust generation, excess heat, exposure to moist air or water.
Incompatibilities with Other Materials: Strong oxidizing agents.
Hazardous Decomposition Products: Carbon monoxide, carbon dioxide, calcium oxide, calcium carbonate.
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 5794-28-5 unlisted.

CAS# 563-72-4 unlisted.

LD50/LC50:

Not available.

Not available.

The mean lethal dose for an adult is felt to be from 10 to 30 grams (143-428 mg/kg) with death resulting from acute kidney failure within a few hours.

Carcinogenicity:

CAS# 5794-28-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 563-72-4: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: A study of railroad car cleaners in Norway who were heavily exposed to oxalic acid solutions and vapors revealed a 53% prevalence of urolithiasis (the formation of urinary stones), compared to a rate of 12% among unexposed workers from the same company.

Teratogenicity: No information found

Reproductive Effects: Oxalic acid caused kidney damage in fetal sheep and rats and disturbed the estrus cycle in rats. Increased sperm abnormalities were seen in the second generation of mice administered 0.2% oxalic acid in the drinking water.

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	TOXIC SOLIDS, ORGANIC, N.O.S.	TOXIC SOLID ORGANIC NOS (CALCIUM OXALATE MONOHYDRATE)
Hazard Class:	6.1	6.1
UN Number:	UN2811	UN2811
Packing Group:	III	III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 5794-28-5 is not on the TSCA Inventory because it is a hydrate. It is considered to be listed if the CAS number for the anhydrous form is on the inventory (40CFR720.3(u)(2)).

CAS# 563-72-4 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 5794-28-5 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

CAS# 563-72-4 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

XN

Risk Phrases:

R 21/22 Harmful in contact with skin and if swallowed.

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 5794-28-5: No information available.

CAS# 563-72-4: No information available.

Canada - DSL/NDSL

CAS# 563-72-4 is listed on Canada's NDSL List.

Canada - WHMIS

This product has a WHMIS classification of D1B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Calcium Phosphate Dibasic

ACC# 04063

Section 1 - Chemical Product and Company Identification

MSDS Name: Calcium Phosphate Dibasic

Catalog Numbers: BP441-500, C135-500

Synonyms: Dicalcium Phosphate; Phosphoric Acid Calcium Salt.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7757-93-9	PHOSPHORIC ACID, CALCIUM SALT	100	231-826-1

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid.

Caution! Eye contact may result in permanent eye damage. Causes severe eye irritation. May cause severe skin irritation. Causes severe respiratory tract irritation.

Target Organs: Eyes.

Potential Health Effects

Eye: Causes eye irritation. May result in corneal injury.

Skin: Causes skin irritation.

Ingestion: Causes gastrointestinal irritation with nausea, vomiting and diarrhea.

Inhalation: Dust is irritating to the respiratory tract.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists. Wash clothing before reuse.

Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear. Do NOT use mouth-to-mouth resuscitation. If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask.

Notes to Physician: Treat symptomatically and supportively. Monitor calcium, phosphate, and magnesium levels if large amounts are ingested.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: In case of fire, use water, dry chemical, chemical foam, or alcohol-resistant foam. Use agent most appropriate to extinguish fire.

Flash Point: Noncombustible.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation. Wash clothing before reuse.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
PHOSPHORIC ACID, CALCIUM SALT	none listed	none listed	none listed

OSHA Vacated PELs: PHOSPHORIC ACID, CALCIUM SALT: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white

Odor: odorless

pH: 6.0-7.4 @ 25% slurry

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Evaporation Rate: Not applicable.

Viscosity: Not available.

Boiling Point: Not applicable.

Freezing/Melting Point: 350 deg C

Decomposition Temperature:350 deg C

Solubility: 0.075% @ 100°C

Specific Gravity/Density:2.3(2H₂O)

Molecular Formula:CaHPO₄

Molecular Weight:136.0584

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, dust generation, electrical sparks.

Incompatibilities with Other Materials: Strong oxidizing agents.

Hazardous Decomposition Products: Oxides of phosphorus, irritating and toxic fumes and gases, calcium oxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 7757-93-9 unlisted.

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 7757-93-9: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7757-93-9 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.
None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7757-93-9 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

WGK (Water Danger/Protection)

CAS# 7757-93-9: 1

Canada - DSL/NDSL

CAS# 7757-93-9 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Calmagite

ACC# 29623

Section 1 - Chemical Product and Company Identification

MSDS Name: Calmagite

Catalog Numbers: AC108170000, AC108170050, AC108170100, AC108171000, AC9386816, 10817-0250

Synonyms: 3-Hydroxy-4-(2-hydroxy-5-methylphenylazo)-1-naphthalenesulfonic acid.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
3147-14-6	Calmagite	100	221-563-0

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: black crystalline powder.

Danger! Causes burns by all exposure routes.

Target Organs: Respiratory system, gastrointestinal system, eyes, skin, mucous membranes.

Potential Health Effects

Eye: Causes eye burns.

Skin: Causes skin burns. May be harmful if absorbed through the skin.

Ingestion: Causes gastrointestinal tract burns. May be harmful if swallowed.

Inhalation: Causes chemical burns to the respiratory tract. May be harmful if inhaled.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Get medical aid immediately. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: Do not induce vomiting. Get medical aid immediately. Call a poison control center.

Inhalation: Get medical aid immediately. Remove from exposure and move to fresh air immediately. If breathing is difficult, give oxygen. Do not use mouth-to-mouth resuscitation if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media: Use foam, dry chemical, or carbon dioxide.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 3; Flammability: 1; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Wear a self contained breathing apparatus and appropriate personal protection. (See Exposure Controls, Personal Protection section). Avoid generating dusty conditions. Provide ventilation. Do not let this chemical enter the environment.

Section 7 - Handling and Storage

Handling: Minimize dust generation and accumulation. Do not get in eyes, on skin, or on

clothing. Do not ingest or inhale. Use only in a chemical fume hood.

Storage: Store in a cool, dry place. Store in a tightly closed container. Corrosives area.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use only under a chemical fume hood.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Calmagite	none listed	none listed	none listed

OSHA Vacated PELs: Calmagite: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Crystalline powder

Appearance: black

Odor: Not available.

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 300 deg C

Decomposition Temperature: Not available.

Solubility: Soluble.

Specific Gravity/Density: Not available.

Molecular Formula: C₁₇H₁₄N₂O₅S

Molecular Weight: 358.38

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, dust generation, excess heat.

Incompatibilities with Other Materials: Strong oxidizing agents, strong reducing agents.

Hazardous Decomposition Products: Carbon monoxide, oxides of nitrogen, oxides of sulfur, carbon dioxide.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 3147-14-6 unlisted.

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 3147-14-6: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: Fish: *Pseudomonas putida*: ; ; No data available.

Environmental: No information available.

Physical: No information available.

Other: Do not empty into drains.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste

regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	ARYL SULFONIC ACIDS, SOLID	ARYL SULFONIC ACIDS, SOLID
Hazard Class:	8	8
UN Number:	UN2585	UN2585
Packing Group:	III	III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 3147-14-6 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 3147-14-6 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

C

Risk Phrases:

R 34 Causes burns.

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 36/37/39 Wear suitable protective clothing, gloves and eye/face protection.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

WGK (Water Danger/Protection)

CAS# 3147-14-6: 1

Canada - DSL/NDSL

CAS# 3147-14-6 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of Not controlled.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CALUMET LUBRICANTS CO -- CALSOL 810 -- 9150-00N078297

=====
Product Identification
=====

Product ID:CAL SOL 810
MSDS Date:08/01/1991
FSC:9150
NIIN:00N078297
MSDS Number: CGGDJ
=== Responsible Party ===
Company Name:CALUMET LUBRICANTS CO
Address:10234 HWY 157
City:PRINCETON
State:LA
ZIP:71057-9172
Country:US
Info Phone Num:318-949-2421
Emergency Phone Num:318-949-2421
Preparer's Name:J HARRIS III
CAGE:EO350

==== Contractor Identification ===
Company Name:CALUMET LUBRICANTS COMPANY
Address:2780 WATERFRONT PKWY EAST, SUITE 200
City:INDIANAPOLIS
State:IN
ZIP:46214
Country:US
Phone:318-949-2421
CAGE:EO350

=====
Composition/Information on Ingredients
=====

Ingred Name:MINERAL OIL, PETROLEUM DISTILLATES, HYDROTREATED (SEVERE),
HEAVY NAPHTHENIC; (SEVERELY HYDROTREATED HEAVY (ING 2)
CAS:64742-52-5
RTECS #:PY8035001
Fraction by Wt: 100%
OSHA PEL:N/K
ACGIH TLV:N/K

Ingred Name:ING 1: NAPHTHENIC DISTILLATE) OR POSSIBLE BLEND OF
INGREDIENT 1 AND 3
RTECS #:9999999ZZ
OSHA PEL:N/K
ACGIH TLV:N/K

Ingred Name:MINERAL OIL, PETROLEUM DISTILLATES, HYDROTREATED (SEVERE)
LIGHT NAPHTHENIC; (SEVERELY HYDROTREATED LIGHT (ING 4)
CAS:64742-53-6
RTECS #:PY8036001
OSHA PEL:N/K
ACGIH TLV:N/K

Ingred Name:ING 3: NAPHTHENIC DISTILLATE)
RTECS #:9999999ZZ
OSHA PEL:N/K
ACGIH TLV:N/K

=====
===== Hazards Identification =====

LD50 LC50 Mixture:NONE SPECIFIED BY MANUFACTURER.
Routes of Entry: Inhalation:YES Skin:YES Ingestion:YES
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:ACUTE: TESTS ON SIMILAR MATERIALS SHOW
A LOW ORDER OF ACUTE TOXICITY. MAY CAUSE MILD REVERSIBLE EYE AND
SKIN IRRITATION. PROLONGED SKIN EXPOSURE MAY CAUSE DERMATITIS OR
OIL ACNE. BREATHING MISTS MAY CAUSE DIZZINESS OR PULMONARY
IRRITATION.INGESTION MAY CAUSE CRAMPS AND DIARRHEA. CHRONIC:
NON-CARCINOGENIC.
Explanation of Carcinogenicity:NOT RELEVANT
Effects of Overexposure:SEE HEALTH HAZARDS.
Medical Cond Aggravated by Exposure:NONE SPECIFIED BY MANUFACTURER.

=====
===== First Aid Measures =====

First Aid:IN ALL CASES REMOVE SOURCE OF EXPOSURE. INHAL: NOT LIKELY TO
OCCUR EXCEPT AS MIST. REMOVE TO FRESH AIR & CONSULT MD. IF BRTHG IS
DFCLT GIVE OXYGEN. IF NOT BRTHG GIVE ARTF RESP. EYES: FLUSH EYES
IMMED W/WATER FOR AT LST 15 MIN OR UNTIL IRRIT SUBSIDES. IF IRRIT
PERSISTS, CONSULT MD. SKIN: WASH THOROUGHLY W/SOAP & WATER. IF
IRRIT/RASH DEVELOPS, CONSULT MD. INGEST: DO NOT INDUCE VOMIT.
CONSULT MD.

=====
===== Fire Fighting Measures =====

Flash Point Method:PMCC
Flash Point:302F,150C
Extinguishing Media:DRY CHEMICAL, CARBON DIOXIDE, WATER FOG AND FOAM.
NOTE: WATER, FOG AND FOAM MAY CAUSE FROTHING AND SPATTERING.
Fire Fighting Procedures:USE NIOSH APPROVED SCBA AND FULL PROTECTIVE
EQUIPMENT . USE WATER SPRAY TO COOL CONTAINERS EXPOSED TO FLAMES.
Unusual Fire/Explosion Hazard:PRODUCTS OF COMBUSTION INCLUDE FUMES,
SMOKE AND CARBON MONOXIDE. MATERIAL MAY IGNITE AT OR ABOVE THE
FLASH POINT IF AN IGNITION SOURCE IS PRESENT.

=====
===== Accidental Release Measures =====

Spill Release Procedures:SHUT OFF IGNITION SOURCES. CONTAIN SPILL AND
KEEP FROM ENTERING WATERWAYS OR SEWERS. LARGE QUANTITIES CAN BE
PUMPED. SMALL QUANTITIES MAY BE SOAKED UP ON OIL ABSORBENTS.
CONSULT YOUR SPCC PLAN.
Neutralizing Agent:NONE SPECIFIED BY MANUFACTURER.

=====
===== Handling and Storage =====

Handling and Storage Precautions:KEEP AWAY FROM FLAMES, SPARKS OR HOT
SURFACES. NEVER USE A TORCH TO CUT/WELD ON OR NEAR CONTAINER. EMPTY
OIL CONTAINERS CAN CONTAIN EXPLOSIVE VAPORS.
Other Precautions:NEVER WEAR OIL SOAKED CLOTHING. LAUNDRER OR DRY CLEAN
BEFORE WEARING. DISCARD OIL SOAKED SHOES. AFFIX PROPER WARNING
LABELS ON CONTAINERS IN ACCORDANCE WITH 29 CFR 1910.

=====
===== Exposure Controls/Personal Protection =====

Respiratory Protection:NORMALLY NOT REQUIRED IF ADEQUATE VENTILATION.
IF EXPOSURE LIMIT IS EXCEEDED, NIOSH APPROVED APPARATUS IS
REQUIRED.

Ventilation:IF MISTS ARE PRESENT, PROVIDE ADEQUATE VENTILATION TO
CONTROL LEVEL BELOW THE PERMISSIBLE EXPOSURE LIMIT.

Protective Gloves:IMPERVIOUS GLOVES .

Eye Protection:OIL RESISTANT (NEOPRENE OR PLASTIC).

Other Protective Equipment:ANSI APPRVD EYE WASH & DELUGE SHOWER . IF
THERE IS A LIKELIHOOD OF OIL SPLASHING, OIL RESISTANT APRON
(SUPDAT)

Work Hygienic Practices:NONE SPECIFIED BY MANUFACTURER.

Supplemental Safety and Health

OTHER PROT EQUIP: SHOULD BE WORN TO PREVENT CLOTHING CONTAMINATION.

===== Physical/Chemical Properties =====

Boiling Pt:B.P. Text:>500F,>260C

Melt/Freeze Pt:M.P/F.P Text:-49F,-45C

Vapor Pres:<0.5 @ 20C

Vapor Density:>5

Spec Gravity:0.9

Evaporation Rate & Reference:NEGLIGIBLE

Solubility in Water:NOT SOLUBLE

Appearance and Odor:CLEAR, PALE STRAW TO WATER WHITE LIQUID; MINERAL
OIL ODOR.

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES

STRONG OXIDIZERS. NEVER PERMIT OIL TO GET IN AN OXYGEN REGULATOR.

Stability Condition to Avoid:NOT APPLICABLE.

Hazardous Decomposition Products:CARBON MONOXIDE AND OTHER COMBUSTION
PRODUCTS OF HYDROCARBONS.

===== Disposal Considerations =====

Waste Disposal Methods:DISPOSE ACCORDING TO CURRENT LOCAL, STATE AND
FEDERAL REGULATIONS. MATERIALS MAY BECOME HAZARDOUS WASTE THROUGH
USE. IF PERMITTED, INCINERATION MAY BE PRACTICAL. CONSIDER
RECYCLING.

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assume responsibility for the suitability of this information to their
particular situation.

Material Safety Data Sheet

Canada balsam, neutral, filtered.

ACC# 04145

Section 1 - Chemical Product and Company Identification

MSDS Name: Canada balsam, neutral, filtered.

Catalog Numbers: 61232-1000, B10-100

Synonyms: Fir, balsam.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
8007-47-4	Canada balsam	100	232-362-2

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: yellow to green liquid.

Caution! May cause eye, skin, and respiratory tract irritation. The toxicological properties of this material have not been fully investigated.

Target Organs: No data found.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation.

Ingestion: May cause irritation of the digestive tract.

Inhalation: May cause respiratory tract irritation.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 1; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Avoid contact with eyes, skin, and clothing. Avoid breathing vapor or mist.

Storage: Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Good general ventilation should be sufficient to control airborne levels.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Canada balsam	none listed	none listed	none listed

OSHA Vacated PELs: Canada balsam: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear chemical splash goggles.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Liquid

Appearance: yellow to green

Odor: fresh green odor

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: > 1

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: Not available.

Decomposition Temperature: Not available.

Solubility: Insoluble.

Specific Gravity/Density: 0.98

Molecular Formula: Varies

Molecular Weight: Not available.

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Excess heat.

Incompatibilities with Other Materials: Strong oxidizing agents.

Hazardous Decomposition Products: Oxides of carbon.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 8007-47-4: CP2352500

LD50/LC50:

CAS# 8007-47-4:

Oral, rat: LD50 = >5 gm/kg;

Skin, rabbit: LD50 = >5 gm/kg;

Carcinogenicity:

CAS# 8007-47-4: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No data available.

Teratogenicity: No data available.

Reproductive Effects: No data available.

Mutagenicity: No data available.

Neurotoxicity: No data available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not Regulated	Not Regulated
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 8007-47-4 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 8007-47-4: immediate.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 8007-47-4 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 8007-47-4: No information available.

Canada - DSL/NDSL

CAS# 8007-47-4 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of Not controlled. .

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

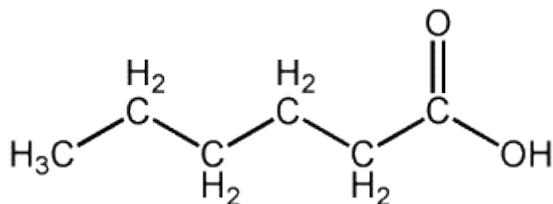
Canadian Ingredient Disclosure List

Hexanoic acid

- Caproic acid
- Butylacetic acid
- Hexylic acid
- Capronic acid
- n-Hexoic acid
- Pentylformic acid

Formula $\text{CH}_3(\text{CH}_2)_4\text{COOH}$

Structure



Description

Oily, colorless or slightly yellow liquid, with a characteristic goat- or limburger cheese-like odor.

Uses

As insect attractant.

Registry Numbers and Inventories.

CAS	142-62-1
NIH PubChem CID	8892
EC (EINECS/ELINCS)	205-550-7
EC Class	C, R: 34-20/21/22, S: 26-36/37/39-45
RTECS	MO5250000
RTECS class	Mutagen; Primary Irritant
UN (DOT)	2829
Merck	13,1765
Beilstein/Gmelin	773837
Beilstein Reference	4-02-00-00917
EPA OPP	128917
FEMA	2559
Swiss Giftliste 1	G-2176
Canada DSL/NDSL	DSL
US TSCA	Listed
Australia AICS	Listed
New Zealand	Listed
Japan ENCS (MITI)	Listed

Korea ECL	Listed
Philippiens PICCS	Listed

Properties.

Formula	C6H12O2
Formula mass	116.16
Melting point, °C	-4.8
Boiling point, °C	202
Vapor pressure, mmHg	0.16 (25 C)
Vapor density (air=1)	4.01
Saturation Concentration	Approximately 260 ppm (0.026%) at 25 C (calculated)
Odor threshold	3.0 mg/kg
Critical temperature	387
Critical pressure	31.58
Density	0.9276 g/cm ³ (20 C)
Solubility in water	Very soluble
Viscosity	2.84 cp (25 C)
Surface tension	23.4 g/s ² @ 70 C
Refractive index	1.4165 (15 C)
pKa/pKb	4.78 (pKa)
Partition coefficient, pK _{ow}	1.84
Heat of vaporization	46.6 kJ/mol
Heat of combustion	-3492 kJ/mol

Hazards and Protection.

Storage	Store in a cool, dry place. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.
<u>WHMIS</u>	D1B E
Handling	Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use only in a well ventilated area. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Do not ingest or inhale.
Protection	Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166. Skin: Wear appropriate protective gloves to prevent skin exposure. Clothing: Wear appropriate protective clothing to prevent skin exposure.
Respirators	Follow the OSHA respirator regulations found in 29CFR 1910.134 or European

Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

Small spills/leaks	Absorb spill with inert material, (e.g., dry sand or earth), then place into a chemical waste container. Do not get water inside containers.
Disposal code	4
Stability	Stable under normal temperatures and pressures.
Incompatibilities	Bases, oxidizing agents, reducing agents.
Decomposition	Carbon monoxide, carbon dioxide.

Fire.

Flash Point, °C	102
Autoignition, °C	380
Upper exp. limit, %	8.2
Lower exp. limit, %	1.3
Fire fighting	Wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Extinguishing media: For small fires, use dry chemical, carbon dioxide, or water spray. For large fires, use dry chemical, carbon dioxide, alcohol-resistant foam, or water spray.
Fire potential	Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes.
Hazards	Some are oxidizers and may ignite combustibles (wood, paper, oil, clothing, etc.). Contact with metals may evolve flammable hydrogen gas. Containers may explode when heated.
Combustion products	Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes.
NEPA	
Health	3
Flammability	1
Reactivity	0

Health.

Exposure limit(s)	OEL-RUSSIA:STEL 5 mg/m3
Poison_Class	4
Exposure effects	Abnormal neuropsychologic function has been reported following hydrochloric acid exposure from a leaking tanker truck.
Ingestion	Causes gastrointestinal tract burns. May cause severe gastrointestinal tract irritation with nausea, vomiting and possible burns.
Inhalation	Effects may be delayed. Causes chemical burns to the respiratory tract. May be harmful if inhaled.

Skin Harmful if absorbed through the skin. Causes skin burns. Effects of contact may be delayed.

Eyes Causes eye burns.

First aid

Ingestion Do NOT induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation Get medical aid immediately. Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

Skin Get medical aid immediately. Immediately flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes.

Eyes Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately. Do NOT allow victim to rub or keep eyes closed.

Transportation.

UN number 2829

Response guide [153](#)

Hazard class 8



Packing Group III

USCG CHRIS Code HXO

[USCG Compatibility Group](#) 4 Organic acids

HS Code 2915 90 80

Std. Transport # 4931450

IMO Chemical Code 18

IMO Pollution Category D

Material Safety Data Sheet

Carmine

ACC# 04352

Section 1 - Chemical Product and Company Identification

MSDS Name: Carmine

Catalog Numbers: C579-25

Synonyms: Carmine aluminum lake; CI 75470

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
1390-65-4	Carmine	100	215-724-4

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: Not available.

Caution! May cause irritation. The toxicological properties of this material have not been fully investigated.

Target Organs: None.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation.

Ingestion: Ingestion of large amounts may cause gastrointestinal irritation. The toxicological properties of this substance have not been fully investigated.

Inhalation: May cause respiratory tract irritation. The toxicological properties of this

substance have not been fully investigated.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. If irritation develops, get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: In case of fire, use water, dry chemical, chemical foam, or alcohol-resistant foam.

Flash Point: Not available

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up, then place into a suitable container for disposal. Avoid generating dusty conditions.

Section 7 - Handling and Storage

Handling: Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with skin and eyes. Avoid ingestion and inhalation.

Storage: Store in a cool, dry place. Keep from contact with oxidizing materials.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Carmine	none listed	none listed	none listed

OSHA Vacated PELs: Carmine: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: Not available.

Odor: none reported

pH: Not available.

Vapor Pressure: Negligible.

Vapor Density: Not available.

Evaporation Rate: Negligible.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 138 - 140 deg C

Decomposition Temperature: Not available.

Solubility: Not available.

Specific Gravity/Density: Not available.

Molecular Formula:C9H6F2O2

Molecular Weight:184.14

Section 10 - Stability and Reactivity

Chemical Stability: Stable.

Conditions to Avoid: Incompatible materials.

Incompatibilities with Other Materials: Strong oxidizers.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide, aluminum oxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 1390-65-4: FH8891000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 1390-65-4: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No data available.

Teratogenicity: No data available.

Reproductive Effects: No data available.

Mutagenicity: No data available.

Neurotoxicity: No data available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 1390-65-4 is not listed on the TSCA inventory. It is for research and development use only.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 1390-65-4 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

Not available.

Risk Phrases:**Safety Phrases:****WGK (Water Danger/Protection)**

CAS# 1390-65-4: No information available.

Canada - DSL/NDSL

CAS# 1390-65-4 is listed on Canada's DSL List.

Canada - WHMIS

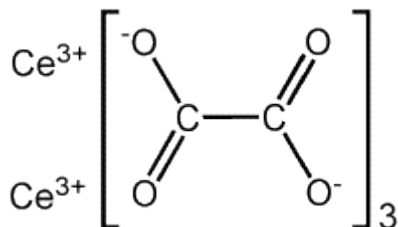
This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Cerium oxalate

- Oxalic acid, cerium salt
- Ethanedioic acid, cerium salt

Formula $\text{Ce}_2\text{C}_6\text{O}_{12}$ **Structure**

Registry Numbers and Inventories.

CAS	7047-99-6
NIH PubChem CID	165565
EC (EINECS/ELINCS)	230-326-0
EC Index Number	607-007-00-3
EC Class	Xn; R21/22
Canada DSL/NDSL	NDSL
US TSCA	Listed
Japan ENCS (MITI)	Listed

Properties.

Formula	$\text{C}_6\text{Ce}_2\text{O}_{12}$
Formula mass	544.29
Melting point, °C	Decomposes
Solubility in water	Slightly soluble

Hazards and Protection.

Storage	Store in a sealed container. Keep away from heat and moisture.
Protection	Always wear approved safety glasses when handling a chemical substance in the laboratory. Wear appropriate chemical resistant gloves and protective clothing.
Respirators	If in form of fine dust and ventilation is not available a respirator should be worn. The use of respirators requires a Respirator Protection Program to be in compliance with 29 CFR 1910.134.
Small spills/leaks	Small spills can be mixed with vermiculite or sodium carbonate and swept up.

Stability	Stable if stored as directed.
Incompatibilities	Oxidizing agents.
Decomposition	Carbon dioxide, carbon monoxide, organic vapors, and metal oxides and carbonates.

Fire.

Fire fighting	Carbon dioxide, dry powder or foam to extinguish. If involved in a fire, fire fighters should be equipped with a NIOSH approved positive pressure self-contained breathing apparatus and full protective clothing.
Combustion products	If involved in a fire this material may emit toxic organic fumes.

Health.

Exposure effects

Ingestion	Ingestion may cause vomiting, pain, violent muscular stimulation, convulsions, collapse, and death.
Inhalation	May be severely irritating to the nose, mucous membranes and respiratory tract.
Skin	May cause moderate to severe irritation of the skin.
Eyes	May cause moderate to severe irritation of the eyes.

First aid

Ingestion	Antidotes are said to be soluble calcium given orally, and calcium gluconate given intravenously, to be administered by trained medical personnel. Keep the victim calm. Give the victim water (only if conscious).
Inhalation	Remove the victim to fresh air. Closely monitor the victim for signs of respiratory problems, such as difficulty in breathing, coughing, wheezing, or pain. In such cases seek immediate medical assistance.
Skin	Wash the affected area with soap and water. Remove contaminated clothes if necessary. Seek medical assistance if irritation persists.
Eyes	Immediately flush the eyes with copious amounts of water for at least 10-15 minutes. A victim may need assistance in keeping their eye lids open. Get immediate medical attention.

Material Safety Data Sheet

Chlorophenol Red

ACC# 72272

Section 1 - Chemical Product and Company Identification

MSDS Name: Chlorophenol Red

Catalog Numbers: AC190040000, AC190040010, AC190040050, AC190040100, AC9532978, AC9655454, AC9681524, NC9596774

Synonyms: CPR; 3'-3'-Dichlorophenylsulfonaphthalein.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
4430-20-0	Chlorophenol Red	99+	224-619-2

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: dark reddish brown crystalline powder.

Warning! Causes eye, skin, and respiratory tract irritation.

Target Organs: Respiratory system, eyes, skin.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Causes skin irritation. May be harmful if absorbed through the skin.

Ingestion: May cause irritation of the digestive tract. May be harmful if swallowed.

Inhalation: Causes respiratory tract irritation. May be harmful if inhaled.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: Do not induce vomiting. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or chemical foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 1; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation. Do not let this chemical enter the environment.

Section 7 - Handling and Storage

Handling: Use with adequate ventilation. Minimize dust generation and accumulation. Do not get in eyes, on skin, or on clothing. Do not ingest or inhale.

Storage: Store in a cool, dry place. Store in a tightly closed container.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Chlorophenol Red	none listed	none listed	none listed

OSHA Vacated PELs: Chlorophenol Red: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Crystalline powder

Appearance: brown - dark reddish brown

Odor: None reported.

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: 14.6

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 261 deg C

Decomposition Temperature: Not available.

Solubility: Insoluble.

Specific Gravity/Density: Not available.

Molecular Formula: C₁₉H₁₂Cl₂O₅S

Molecular Weight: 423.26

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, dust generation, excess heat.

Incompatibilities with Other Materials: Strong oxidizing agents.

Hazardous Decomposition Products: Hydrogen chloride, carbon monoxide, oxides of sulfur, carbon dioxide.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 4430-20-0 unlisted.

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 4430-20-0: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: No information available.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information available.

Physical: No information available.

Other: Do not empty into drains.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated.	Not regulated.
Hazard Class:		(8)
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 4430-20-0 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313

No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 4430-20-0 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XI

Risk Phrases:

R 36/37/38 Irritating to eyes, respiratory system and skin.

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 37/39 Wear suitable gloves and eye/face protection.

WGK (Water Danger/Protection)

CAS# 4430-20-0: 1

Canada - DSL/NDSL

CAS# 4430-20-0 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 4430-20-0 is not listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Chloramine-T trihydrate

ACC# 45371

Section 1 - Chemical Product and Company Identification

MSDS Name: Chloramine-T trihydrate

Catalog Numbers: AC227850000, AC227850250, AC227852500, 22785-0010, NES6100-250, O1779-250

Synonyms: N-Chloro-p-toluenesulfonamide, sodium salt; Tosylchloramide sodium.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7080-50-4	Chloramine-T trihydrate	98	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white to off-white crystalline powder.

Danger! Causes burns by all exposure routes. Harmful if swallowed. May cause allergic respiratory reaction. Contact with acids liberates toxic gas.

Target Organs: Central nervous system, respiratory system, gastrointestinal system, eyes, skin.

Potential Health Effects

Eye: Causes eye burns.

Skin: Causes skin burns. May be harmful if absorbed through the skin. NIOSHTIC 1997: A case of occupational allergic contact urticaria from chloramine-T solution in a 48 yr old hospital bath attendant was described. The authors conclude that she suffers from

occupational allergic contact urticaria caused by chloramine-T. Merck MSDS issued in May 2004 says rabbit skin tests resulted in burns.

Ingestion: Harmful if swallowed. Causes gastrointestinal tract burns.

Inhalation: May cause allergic respiratory reaction. Causes chemical burns to the respiratory tract. May be harmful if inhaled.

Chronic: Laboratory experiments have resulted in mutagenic effects. Repeated or prolonged exposure may cause allergic reactions in sensitive individuals. Exposure to high concentrations may cause central nervous system depression.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Get medical aid immediately. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: Do not induce vomiting. Get medical aid immediately. Call a poison control center.

Inhalation: Get medical aid immediately. Remove from exposure and move to fresh air immediately. If breathing is difficult, give oxygen. Do not use mouth-to-mouth resuscitation if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or chemical foam.

Flash Point: 192 deg C (377.60 deg F)

Autoignition Temperature: Not available.

Explosion Limits, Lower:Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 3; Flammability: 1; Instability: 1

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Wear a self contained breathing apparatus and appropriate personal protection. (See Exposure Controls, Personal Protection section). Provide ventilation. Do not let this chemical enter the environment.

Section 7 - Handling and Storage

Handling: Do not get in eyes, on skin, or on clothing. Do not ingest or inhale. Use only in a chemical fume hood. Acids should not be used around this material unless absolutely necessary and then only after careful planning. Contact with acids liberates toxic gas.

Storage: Store in a cool, dry place. Store in a tightly closed container. Corrosives area. Keep away from acids.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use only under a chemical fume hood.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Chloramine-T trihydrate	none listed	none listed	none listed
Chloramine-T anhydrous	none listed	none listed	none listed

OSHA Vacated PELs: Chloramine-T trihydrate: No OSHA Vacated PELs are listed for this chemical. Chloramine-T anhydrous: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Crystalline powder

Appearance: white to off-white

Odor: chlorine-like

pH: 8 - 10 (5% aq.sol.)

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.
Boiling Point: Not available.
Freezing/Melting Point: 170 - 177 deg C (decom)
Decomposition Temperature: Not available.
Solubility: Soluble.
Specific Gravity/Density: Not available.
Molecular Formula: C7H7CINNaO2S.3H2O
Molecular Weight: 281.69

Section 10 - Stability and Reactivity

Chemical Stability: Contact with acid liberates gas. Air sensitive.
Conditions to Avoid: Incompatible materials, exposure to air, excess heat, temperatures above 130°C.
Incompatibilities with Other Materials: Strong oxidizing agents, acids.
Hazardous Decomposition Products: Hydrogen chloride, chlorine, carbon monoxide, oxides of nitrogen, oxides of sulfur, carbon dioxide.
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:
CAS# 7080-50-4 unlisted.
CAS# 127-65-1: XT5616800
LD50/LC50:
Not available.
Not available.

Carcinogenicity:
CAS# 7080-50-4: Not listed by ACGIH, IARC, NTP, or CA Prop 65.
CAS# 127-65-1: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found
Teratogenicity: No information found
Reproductive Effects: No information found
Mutagenicity: Mutagenic effects have occurred in experimental animals.
Neurotoxicity: No information found
Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information available.

Physical: No information available.

Other: Do not empty into drains.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	CORROSIVE SOLID, BASIC, ORGANIC, N.O.S.	CORROSIVE SOLID, BASIC, ORGANIC, N.O.S.
Hazard Class:	8	8
UN Number:	UN3263	UN3263
Packing Group:	III	III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7080-50-4 is not on the TSCA Inventory because it is a hydrate. It is considered to be listed if the CAS number for the anhydrous form is on the inventory (40CFR720.3(u)(2)).

CAS# 127-65-1 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 127-65-1: immediate, reactive.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7080-50-4 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

CAS# 127-65-1 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

C

Risk Phrases:

R 22 Harmful if swallowed.

R 31 Contact with acids liberates toxic gas.

R 34 Causes burns.

R 42 May cause sensitization by inhalation.

Safety Phrases:

S 22 Do not breathe dust.

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 36/37/39 Wear suitable protective clothing, gloves and eye/face protection.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 7 Keep container tightly closed.

WGK (Water Danger/Protection)

CAS# 7080-50-4: No information available.

CAS# 127-65-1: 2

Canada - DSL/NDSL

CAS# 127-65-1 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 127-65-1 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Chloroacetic Acid

ACC# 04690

Section 1 - Chemical Product and Company Identification

MSDS Name: Chloroacetic Acid

Catalog Numbers: A176 500, A176-500, A176500

Synonyms: Chloroethanoic Acid; Monochloroacetic Acid; Momochloroethanoic Acid

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
79-11-8	CHLOROACETIC ACID	>98	201-178-4

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: colorless or white solid.

Danger! Corrosive. Causes eye and skin burns. Causes digestive and respiratory tract burns. May be harmful if swallowed. May cause central nervous system effects. May cause lung damage. May cause liver and kidney damage.

Target Organs: Kidneys, central nervous system, liver.

Potential Health Effects

Eye: May cause irreversible eye injury. Contact with liquid is corrosive to the eyes and causes severe burns.

Skin: Contact with liquid is corrosive and causes severe burns and ulceration.

Ingestion: May cause perforation of the digestive tract. Causes severe digestive tract burns with abdominal pain, vomiting, and possible death. May cause corrosion and

permanent tissue destruction of the esophagus and digestive tract. May be harmful if swallowed.

Inhalation: Inhalation of high concentrations may cause central nervous system effects characterized by nausea, headache, dizziness, unconsciousness and coma. May cause liver and kidney damage. Causes severe irritation of upper respiratory tract with coughing, burns, breathing difficulty, and possible coma. May cause pulmonary edema and severe respiratory disturbances. May cause kidney damage.

Chronic: May cause liver and kidney damage.

Section 4 - First Aid Measures

Eyes: Get medical aid immediately. Do NOT allow victim to rub eyes or keep eyes closed. Extensive irrigation with water is required (at least 30 minutes).

Skin: Get medical aid immediately. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Destroy contaminated shoes.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid immediately. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Get medical aid immediately. Remove from exposure and move to fresh air immediately. If breathing is difficult, give oxygen. Do NOT use mouth-to-mouth resuscitation. If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask.

Notes to Physician: Chloroacetic acid causes competitive inhibition of acetate oxidation and acetylates sulfhydryl residues in the liver and kidney.

Section 5 - Fire Fighting Measures

General Information: During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Use water spray to keep fire-exposed containers cool. Wear appropriate protective clothing to prevent contact with skin and eyes. Wear a self-contained breathing apparatus (SCBA) to prevent contact with thermal decomposition products. Contact with metals may evolve flammable hydrogen gas. Containers may explode when heated. Combustible material; may burn but does not ignite readily.

Extinguishing Media: Water or foam may cause frothing. Use water spray to cool fire-exposed containers. Do NOT get water inside containers. For small fires, use dry chemical, carbon dioxide, or water spray. For large fires, use dry chemical, carbon dioxide, alcohol-resistant foam, or water spray. Cool containers with flooding quantities of water until well after fire is out.

Flash Point: 126 deg C (258.80 deg F)

Autoignition Temperature: 470 deg C (878.00 deg F)

Explosion Limits, Lower:8.0.

Upper: Not available.

NFPA Rating: (estimated) Health: 3; Flammability: 1; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Remove all sources of ignition. Provide ventilation. Do not get water inside containers. Cover with dry earth, dry sand, or other non-combustible material followed with plastic sheet to minimize spreading and contact with water.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Minimize dust generation and accumulation. Keep container tightly closed. Do not get on skin or in eyes. Do not ingest or inhale. Discard contaminated shoes.
Storage: Store in a tightly closed container. Keep from contact with oxidizing materials. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from metals. Keep away from reducing agents. Do not store in metal containers. Do not store near alkaline substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
CHLOROACETIC ACID	none listed	none listed	none listed

OSHA Vacated PELs: CHLOROACETIC ACID: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or

European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid
Appearance: colorless or white
Odor: acetic odor
pH: 1.93 (0.1M)
Vapor Pressure: .75 mm Hg @ 20C
Vapor Density: 3.2 (air=1)
Evaporation Rate:1 (butyl acetate=1)
Viscosity: 2.16 cp@70C
Boiling Point: 189 deg C
Freezing/Melting Point:62 deg C
Decomposition Temperature:Not available.
Solubility: Soluble in water.
Specific Gravity/Density:1.404 (water=1)
Molecular Formula:C₂H₃ClO₂
Molecular Weight:94.4728

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions.
Conditions to Avoid: Incompatible materials, ignition sources, dust generation, moisture, metals, excess heat.
Incompatibilities with Other Materials: Strong oxidizers, amines, alcohols, reducing agents, metals, and alkali.
Hazardous Decomposition Products: Carbon monoxide, irritating and toxic fumes and gases, carbon dioxide.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 79-11-8: AF8575000
LD50/LC50:
CAS# 79-11-8:
Inhalation, rat: LC50 = 180 mg/m³;
Oral, rat: LD50 = 55 mg/kg;

Carcinogenicity:

CAS# 79-11-8: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: This chemical has shown mutagenic effects in laboratory animals.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. 96-hr LC50; fathead minnow: GT100 mg/L 96-Hr LC50; water flea: 80 mg/L

Environmental: Plant germination effects: No adverse effects at: Ryegrass 10 mg/L Radish 10 mg/L Lettuce 10 mg/L Plant seedling effects: No adverse effects at: Nargold 10 mg/L Radish 10 mg/L Lettuce 10 mg/L Corn 100 mg/L

Physical: No information available.

Other: No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	CHLOROACETIC ACID, SOLID	CHLOROACETIC ACID SOLID
Hazard Class:	6.1	6.1(8)
UN Number:	UN1751	UN1751
Packing Group:	II	II

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 79-11-8 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 79-11-8: 1 lb statutory RQ; 0.454 kg statutory RQ; 100 lb final RQ; 45.4 kg final RQ

SARA Section 302 Extremely Hazardous Substances

CAS# 79-11-8: 100 lb TPQ (lower threshold); 10000 lb TPO (upper threshold)

SARA Codes

CAS # 79-11-8: immediate, delayed.

Section 313

This material contains CHLOROACETIC ACID (CAS# 79-11-8, >98%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

CAS# 79-11-8 is listed as a hazardous air pollutant (HAP).

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 79-11-8 can be found on the following state right to know lists: New Jersey, Pennsylvania, Minnesota, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

T N

Risk Phrases:

R 25 Toxic if swallowed.

R 34 Causes burns.

R 50 Very toxic to aquatic organisms.

Safety Phrases:

S 23 Do not inhale gas/fumes/vapour/spray.

S 37 Wear suitable gloves.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 61 Avoid release to the environment. Refer to special instructions /safety data sheets.

WGK (Water Danger/Protection)

CAS# 79-11-8: 2

Canada - DSL/NDSL

CAS# 79-11-8 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D1A, E.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 79-11-8 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Cholesterol

ACC# 04915

Section 1 - Chemical Product and Company Identification

MSDS Name: Cholesterol

Catalog Numbers: BP946-100, BP946-500, C314-500

Synonyms: (3.beta.)-cholest-5-en-3-ol

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
57-88-5	CHOLESTEROL	100	200-353-2

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid.

Caution! May cause eye, skin, and respiratory tract irritation. This is expected to be a low hazard for usual industrial handling.

Target Organs: None.

Potential Health Effects

Eye: Dust may cause mechanical irritation.

Skin: May cause skin irritation. Low hazard for usual industrial handling.

Ingestion: Ingestion of large amounts may cause gastrointestinal irritation. Expected to be a low ingestion hazard.

Inhalation: May cause respiratory tract irritation. Low hazard for usual industrial handling.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. If irritation develops, get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Antidote: None reported.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. This material in sufficient quantity and reduced particle size is capable of creating a dust explosion.

Extinguishing Media: In case of fire, use water, dry chemical, chemical foam, or alcohol-resistant foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Sweep up, then place into a suitable container for disposal. Avoid generating dusty conditions.

Section 7 - Handling and Storage

Handling: Use with adequate ventilation. Avoid contact with skin and eyes. Avoid ingestion

and inhalation.

Storage: Keep from contact with oxidizing materials.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
CHOLESTEROL	none listed	none listed	none listed

OSHA Vacated PELs: CHOLESTEROL: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Wear a NIOSH/MSHA or European Standard EN 149 approved full-facepiece airline respirator in the positive pressure mode with emergency escape provisions.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white

Odor: practically odorless

pH: Not available.

Vapor Pressure: Negligible.

Vapor Density: Not available.

Evaporation Rate: Negligible.

Viscosity: Not available.

Boiling Point: 360 deg C

Freezing/Melting Point: 148.9 deg C

Decomposition Temperature: 360 deg C

Solubility: 0.2% in water.

Specific Gravity/Density: 1.067

Molecular Formula: C₂₇H₄₄OH

Molecular Weight: 385.3144

Section 10 - Stability and Reactivity

Chemical Stability: Stable.

Conditions to Avoid: Incompatible materials.

Incompatibilities with Other Materials: Strong oxidizing agents.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 57-88-5: FZ8400000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 57-88-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No data available.

Teratogenicity: No data available.

Reproductive Effects: No data available.

Mutagenicity: No data available.

Neurotoxicity: No data available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	CARBON DIOXIDE, SOLID USED FOR DIAGNOSTIC OR TREATMENT PURPOSE	No information available.
Hazard Class:	9	
UN Number:		
Packing Group:	III	

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 57-88-5 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 57-88-5: delayed.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 57-88-5 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

WGK (Water Danger/Protection)

CAS# 57-88-5: 1

Canada - DSL/NDSL

CAS# 57-88-5 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of Not controlled.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

SIGMA CHEMICAL COMPANY -- C4384 CHONDROITIN SULFATE C SODIUM FROM SHARK CARTILAGE -- 6550-00F054215

=====
Product Identification
=====

Product ID:C4384 CHONDROITIN SULFATE C SODIUM FROM SHARK CARTILAGE
MSDS Date:05/19/1997
FSC:6550
NIIN:00F054215
MSDS Number: CFGSR
=== Responsible Party ===
Company Name:SIGMA CHEMICAL COMPANY
Address:3050 SPRUCE ST
Box:14508
City:SAINT LOUIS
State:MO
ZIP:63178-5000
Country:US
Info Phone Num:314-771-5765/800-325-3010
Emergency Phone Num:314-771-5765/800-325-3010
CAGE:21076

==== Contractor Identification ====

Company Name:SIGMA CHEMICAL COMPANY
Address:3050 SPRUCE ST
Box:14508
City:ST LOUIS
State:MO
ZIP:63178
Country:US
Phone:314-771-5765
CAGE:21076

=====
Composition/Information on Ingredients
=====

Ingred Name:CHONDROITIN, 6-(HYDROGEN SULFATE), SODIUM SALT
CAS:12678-07-8

=====
Hazards Identification
=====

LD50 LC50 Mixture:ORAL LD50(RAT): >10 GM/KG
Routes of Entry: Inhalation:YES Skin:YES Ingestion:YES
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:MAY BE HARMFUL BY INHALATION,
INGESTION/SKIN ABSORPTION. MAY CAUSE IRRITATION.
Explanation of Carcinogenicity:NONE
Effects of Overexposure:IRRITATION.

=====
First Aid Measures
=====

First Aid:INGESTION: WASH OUT MOUTH W/WATER IF CONSCIOUS. SKIN: FLUSH
W/COPIOUS AMOUNTS OF WATER FOR 15 MINS. INHALATION: REMOVE TO FRESH
AIR. EYES: FLUSH W/COPIOUS AMOUNTS OF WATER FOR 15 MINS. OBTAIN
MEDICAL ATTENTION IN ALL CASES.

=====
Fire Fighting Measures
=====

Extinguishing Media:WATER SPRAY, CO2, DRY CHEMICAL POWDER/APPROPRIATE

FOAM.

Fire Fighting Procedures:WEAR SCBA & PROTECTIVE CLOTHING.

Unusual Fire/Explosion Hazard:EMITS TOXIC FUMES UNDER FIRE CONDITIONS.

===== Accidental Release Measures =====

Spill Release Procedures:WEAR PROTECTIVE EQUIPMENT. SWEEP UP, PLACE IN
A BAG & HOLD FOR WASTE DISPOSAL. AVOID RAISING DUST. VENTILATE AREA
& WASH SITE AFTER MATERIAL PICKUP IS COMPLETE.

===== Exposure Controls/Personal Protection =====

Respiratory Protection:WEAR APPROPRIATE NIOSH/MSHA APPROVED RESPIRATOR.

Ventilation:MECHANICAL EXHAUST REQUIRED.

Protective Gloves:CHEMICAL RESISTANT

Eye Protection:SAFETY GOGGLES

Other Protective Equipment:PROTECTIVE CLOTHING.

Work Hygienic Practices:REMOVE/LAUNDER CONTAMINATED CLOTHING & SHOES
BEFORE REUSE.

Supplemental Safety and Health

===== Physical/Chemical Properties =====

Solubility in Water:COMPLETE

Appearance and Odor:SOLID

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES

Hazardous Decomposition Products:COMBUSTION: CO, CO2, NITROGEN OXIDES,
SULFUR OXIDES.

===== Disposal Considerations =====

Waste Disposal Methods:DISSOLVE/MIX W/A COMBUSTIBLE SOLVENT & BURN IN A
CHEMICAL INCINERATOR EQUIPPED W/AN AFTERBURNER & SCRUBBER,
IAW/FEDERAL, STATE & LOCAL REGULATIONS.

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particular situation.

Material Safety Data Sheet

Chromium (III) oxide

ACC# 05060

Section 1 - Chemical Product and Company Identification

MSDS Name: Chromium (III) oxide

Catalog Numbers: AC192080000, AC192085000, AC353580000, C333-3, C334-500, NC9526419, NC9527292, NC9609821, S79968, XXC33410KG

Synonyms: Chromic Sesquioxide; chrome green; chrome oxide; chromium sesquioxide; chromium (3+) trioxide; dichromium trioxide

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
1308-38-9	Chromium (III) oxide	99-100.0	215-160-9

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: light to dark green powder.

Warning! May cause allergic skin reaction. May cause eye, skin, and respiratory tract irritation. Hygroscopic (absorbs moisture from the air).

Target Organs: None.

Potential Health Effects

Eye: Dust may cause mechanical irritation.

Skin: May cause skin irritation. May cause an allergic reaction in certain individuals.

Ingestion: Ingestion of large amounts may cause gastrointestinal irritation.

Inhalation: May cause respiratory tract irritation. Chromium (III) oxide is poorly absorbed

into the body and, therefore, exists mostly as a "nuisance" dust.

Chronic: Prolonged or repeated skin contact may cause sensitization dermatitis and possible destruction and/or ulceration. Repeated inhalation may cause chronic bronchitis. A review of studies conducted over 100 years showed no conclusive evidence for a cancer hazard among workers exposed to aerosols formed by chromium metal or Chromium (III) compounds. The International Agency for Research on Cancer (IARC) has concluded that there is inadequate evidence in humans or experimental animals for the carcinogenicity of Chromium (III) compounds. The overall evaluation concluded that Chromium (III) compounds are not classifiable as to their carcinogenicity to humans.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Get medical aid immediately. Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire.

Flash Point: Not available.

Autoignition Temperature: Noncombustible.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up or absorb material, then place into a suitable clean, dry, closed container for disposal. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use only in a well-ventilated area. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation. Wash clothing before reuse.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Store protected from moisture.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Chromium (III) oxide	none listed	none listed	none listed

OSHA Vacated PELs: Chromium (III) oxide: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Powder

Appearance: light to dark green

Odor: odorless

pH: 7.5@ 0.5% soln.

Vapor Pressure: Not applicable.

Vapor Density: Not applicable.

Evaporation Rate:Not available.

Viscosity: Not applicable.

Boiling Point: 4000 deg C

Freezing/Melting Point:2435 deg C

Decomposition Temperature:Not available.

Solubility: insoluble in water.

Specific Gravity/Density:5.21 (water=1)

Molecular Formula:Cr₂O₃

Molecular Weight:151.9902

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions. Hygroscopic: absorbs moisture or water from the air.

Conditions to Avoid: Dust generation, exposure to moist air or water.

Incompatibilities with Other Materials: Alkaline earth metals, chlorine trifluoride, oxygen difluoride, lithium, rubidium, rubidium acetylide, glycerol.

Hazardous Decomposition Products: Not known.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 1308-38-9: GB6475000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 1308-38-9: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: A review of studies conducted over 100 years showed no conclusive evidence for a cancer hazard among workers exposed to aerosols formed by chromium metal or Chromium (III) compounds. The International Agency for Research on Cancer (IARC) has concluded that there is inadequate evidence in humans or experimental animals for the carcinogenicity of Chromium (III) compounds. The overall evaluation concluded that Chromium (III) compounds are not classifiable as to their carcinogenicity to humans.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: No information available.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information found.

Physical: No information found.

Other: No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Please contact Fisher Scientific for shipping information	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 1308-38-9 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 1308-38-9: immediate, delayed.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 1308-38-9 can be found on the following state right to know lists: New Jersey, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 28 After contact with skin, wash immediately with...

WGK (Water Danger/Protection)

CAS# 1308-38-9: 1

Canada - DSL/NDSL

CAS# 1308-38-9 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 1308-38-9 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Chromium potassium sulfate dodecahydrate, p.a.

ACC# 01269

Section 1 - Chemical Product and Company Identification

MSDS Name: Chromium potassium sulfate dodecahydrate, p.a.

Catalog Numbers: AC222520000, AC222520050, AC222521000, AC222525000

Synonyms: Chromium (III) Potassium sulfate, dodecadrate; Chromic Alum (Dodecahydrate); Potassium Chromium Alum Dodecahydrate.

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7788-99-0	Chromium (III) Potassium Sulfate Dodecahydrate	100	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: purple - grey.

Warning! Causes eye, skin, and respiratory tract irritation. May cause allergic skin reaction.

Target Organs: Lungs.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Causes skin irritation. May cause skin sensitization, an allergic reaction, which becomes evident upon re-exposure to this material.

Ingestion: No hazard expected in normal industrial use.

Inhalation: Dust is irritating to the respiratory tract. Causes irritation of mucous membrane.

Chronic: Prolonged or repeated skin contact may cause defatting and dermatitis.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use only in a well-ventilated area. Avoid contact with eyes, skin, and clothing. Avoid contact with skin and eyes. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep containers tightly closed.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Chromium (III) Potassium Sulfate Dodecahydrate	none listed	none listed	none listed

OSHA Vacated PELs: Chromium (III) Potassium Sulfate Dodecahydrate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Crystals

Appearance: purple - grey

Odor: None reported

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: 400 deg C

Freezing/Melting Point: 88.9 deg C

Decomposition Temperature: Not available.

Solubility: 19.6 % in water

Specific Gravity/Density: 1.8

Molecular Formula: CrKSS2O8.12H2O

Molecular Weight: 556.9495

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, excess heat.

Incompatibilities with Other Materials: Strong oxidizing agents, heat.

Hazardous Decomposition Products: Oxides of sulfur, chromium fumes.

Hazardous Polymerization: Has not been reported

Section 11 - Toxicological Information

RTECS#:

CAS# 7788-99-0: GB6850000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 7788-99-0: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: Mutation data reported.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7788-99-0 is not on the TSCA Inventory because it is a hydrate. It is considered to be listed if the CAS number for the anhydrous form is on the inventory (40CFR720.3(u)(2)).

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 7788-99-0: immediate, delayed.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7788-99-0 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XI

Risk Phrases:

R 36/38 Irritating to eyes and skin.

Safety Phrases:

S 22 Do not breathe dust.

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 28 After contact with skin, wash immediately with...

WGK (Water Danger/Protection)

CAS# 7788-99-0: No information available.

Canada - DSL/NDSL

None of the chemicals in this product are listed on the DSL or NDSL list.

Canada - WHMIS

not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 7788-99-0 is not listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Chromium (III) Sulfate Hydrate

ACC# 04970

Section 1 - Chemical Product and Company Identification

MSDS Name: Chromium (III) Sulfate Hydrate

Catalog Numbers: C338-500

Synonyms: Chromic sulfate; dichromium sulfate; sulfuric acid chromium salt

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
10101-53-8	Chromium (III) Sulfate Hydrate	100%	233-253-2

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: green to violet to red solid.

Warning! Causes eye, skin, and respiratory tract irritation. May cause allergic skin reaction.

Target Organs: Respiratory system, eyes, skin.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Causes skin irritation. May cause skin sensitization, an allergic reaction, which becomes evident upon re-exposure to this material.

Ingestion: Causes gastrointestinal irritation with nausea, vomiting and diarrhea.

Inhalation: Causes respiratory tract irritation.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. If irritation develops, get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Runoff from fire control or dilution water may cause pollution.

Extinguishing Media: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Minimize dust generation and accumulation. Avoid contact with skin and eyes.

Keep container tightly closed. Avoid ingestion and inhalation. Use with adequate ventilation.
Storage: Store in a cool, dry place. Store in a tightly closed container.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Chromium (III) Sulfate Hydrate	none listed	none listed	none listed

OSHA Vacated PELs: Chromium (III) Sulfate Hydrate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: green to violet to red

Odor: odorless

pH: 1.0-2.5 5% solution

Vapor Pressure: Negligible.

Vapor Density: Not available.

Evaporation Rate: Not applicable.

Viscosity: Not applicable.

Boiling Point: Not available.

Freezing/Melting Point: Not available.

Decomposition Temperature: Not available.

Solubility: Soluble in water.

Specific Gravity/Density: 1.7-3.0

Molecular Formula: Cr₂(SO₄)₃.nH₂O

Molecular Weight: 392.1648

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: None reported.

Incompatibilities with Other Materials: Hydrogen gas may be evolved from moist chromic sulfate. If damp material is sealed for a prolonged period of time, the container may rupture because of the pressure of hydrogen. Reacts violently with reducing agents, combustibles, ammonia, halides, phosphorous, sodium azide, elemental sulfur and urea.

Hazardous Decomposition Products: Oxides of sulfur, oxides of sulfur.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 10101-53-8: GB7200000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 10101-53-8: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: Mutagenic effects have occurred in humans.

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 10101-53-8 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 10101-53-8: 1000 lb final RQ; 454 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 10101-53-8: immediate, delayed.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

CAS# 10101-53-8 is listed as a Hazardous Substance under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 10101-53-8 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

XI

Risk Phrases:

R 36/37/38 Irritating to eyes, respiratory system and skin.

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 10101-53-8: 1

Canada - DSL/NDSL

CAS# 10101-53-8 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 10101-53-8 is listed on the Canadian Ingredient Disclosure List.

SUPELCO INC -- CHROMOSORB PAW-DMCS 80/100, 20207 -- 6810-00N059180

=====
===== Product Identification =====

Product ID:CHROMOSORB PAW-DMCS 80/100, 20207

MSDS Date:10/25/1989

FSC:6810

NIIN:00N059180

MSDS Number: BXGNH

=== Responsible Party ===

Company Name:SUPELCO INC

Address:SUPELCO PARK

City:BELLEFONTE

State:PA

ZIP:16823-0048

Country:US

Info Phone Num:814-359-3441

Emergency Phone Num:814-359-3441

CAGE:54968

=== Contractor Identification ===

Company Name:SIGMA-ALDRICH INC.

Address:3050 SPRUCE STREET

Box:14508

City:ST. LOUIS

State:MO

ZIP:63103

Country:US

Phone:314-771-5765/414-273-3850X5996

CAGE:54968

=====
===== Composition/Information on Ingredients =====

Ingred Name:DIATOMACEOUS EARTH, FLUX-CALCINED; (SILICA, AMORPHOUS
DIATOMACEOUS EARTH)

CAS:68855-54-9

Fraction by Wt: 90%

OSHA PEL:6 MG/M3

ACGIH TLV:10 MG/M3

Ingred Name:SILICA, CRYSTALLINE - CRISTOBALITE

CAS:14464-46-1

RTECS #:VV7325000

Fraction by Wt: 10%

OSHA PEL:0.05 MG/M3 (MFR)

ACGIH TLV:0.05 MG/M3 RDUST

=====
===== Hazards Identification =====

Routes of Entry: Inhalation:YES Skin:NO Ingestion:NO

Reports of Carcinogenicity:NTP:YES IARC:YES OSHA:NO

Health Hazards Acute and Chronic:DUST MAY CAUSE RESPIRATORY INJURY IF
INHALED. OVEREXPOSURE TO AMORPHOUS SILICA DUSTS OVER PROTRACTED
PERIODS MAY RESULT IN PNEUMOCONIOSIS WHEREAS CRYSTALLINE SILICAS
CONTRIBUTE TO SILICOSIS.

Explanation of Carcinogenicity:SILICA, CRYSTALLINE-CRISTOBALITE:IARC
MONOGRAPHS, SUPP, VOL 7, PG 341, 1987:GRP 2A. NTP 7TH ANNUAL RPT ON
(SUPP DATA)

Effects of Overexposure:SEE HEALTH HAZARDS.
Medical Cond Aggravated by Exposure:NONE SPECIFIED BY MANUFACTURER.

=====
===== First Aid Measures =====

First Aid:INGEST:CALL MD IMMEDIATELY . EYES:FLUSH W/WATER FOR AT LEAST
15 MINUTES. SKIN:FLUSH W/LARGE VOLUMES OF WATER. INHAL:IMMEDIATELY
MOVE TO FRESH AIR.

=====
===== Fire Fighting Measures =====

Extinguishing Media:THIS MATERIAL IS NOT FLAMMABLE. EXTINGUISHING MEDIA
DETERMINED BY SUPPORTING FIRE.
Fire Fighting Procedures:USE NIOSH/MSHA APPROVED SCBA & FULL PROTECTIVE
EQUIPMENT .

=====
===== Accidental Release Measures =====

Spill Release Procedures:SWEEP UP MATERIAL. AVOID GENERATING DUST.
Neutralizing Agent:NONE SPECIFIED BY MANUFACTURER.

=====
===== Handling and Storage =====

Handling and Storage Precautions:AVOID GENERATING DUST.
Other Precautions:THIS MATL IS INTENDED FOR R&D USE ONLY & MAY NOT BE
USED FOR DRUG, HOUSEHOLD OR OTHER PURPOSES. THIS MATL SHOULD BE
HANDLED ONLY BY QUALIFIED PERSONS TRAINED IN LAB PROCEDURES & GOOD
SAFETY PRACTICES.

=====
===== Exposure Controls/Personal Protection =====

Respiratory Protection:WEAR NIOSH/MSHA APPROVED RESPIRATORY PROTECTION.
NIOSH/MSHA APPROVED RESPIRATOR FOR PNEUMOCONIOSIS PRODUCING DUST.
Ventilation:USE ONLY IN WELL VENTILATED AREA.
Protective Gloves:IMPERVIOUS GLOVES .
Eye Protection:ANSI APPROVED CHEM WORKERS GOGGS .
Other Protective Equipment:NONE SPECIFIED BY MANUFACTURER.
Work Hygienic Practices:NONE SPECIFIED BY MANUFACTURER.
Supplemental Safety and Health
EXPLAN OF CARCIN:CARCINOGENS, 1994:ANTICIPATED TO BE CARCINOGEN.

=====
===== Physical/Chemical Properties =====

Boiling Pt:B.P. Text:4226F,2330C
Melt/Freeze Pt:M.P/F.P Text:3110F,1710C
Vapor Pres:0
Vapor Density:0
Spec Gravity:2.3 (H*20=1)
Evaporation Rate & Reference:0
Solubility in Water:0%
Appearance and Odor:PINK SOLID; ODORLESS.
Percent Volatiles by Volume:0

=====
===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES
STRONG BASES, HYDROFLUORIC ACID.

===== Disposal Considerations =====

Waste Disposal Methods:COMPLY W/ALL APPLICABLE FEDERAL, STATE OR LOCAL REGULATIONS.

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Material Safety Data Sheet

Cobalt oxide

ACC# 05294

Section 1 - Chemical Product and Company Identification

MSDS Name: Cobalt oxide

Catalog Numbers: AC206220000, AC206220250, AC206220500, S75093, C382-500, NC9004072, XXC3825KG

Synonyms: Cobaltic-cobaltous oxide; Cobaltous oxide; Tricobalt tetraoxide; Cobalt oxide Co₃O₄; Cobalt (II,III) oxide; Cobalto-cobaltic oxide.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
1308-06-1	Cobalt oxide Co ₃ O ₄	100	215-157-2

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: black-gray crystalline powder.

Warning! May cause allergic skin reaction. May cause eye, skin, and respiratory tract irritation. May be harmful if swallowed. May cause cancer based on animal studies.

Hygroscopic (absorbs moisture from the air). This product contains cobalt(II) oxide, a chemical known to the state of California to cause cancer.

Target Organs: Lungs, skin.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation. May cause skin sensitization, an allergic reaction, which

becomes evident upon re-exposure to this material.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. May be harmful if swallowed.

Inhalation: May cause respiratory tract irritation. May cause chronic airway hyperreactivity and asthma, with changes in pulmonary function.

Chronic: Cobalt compounds may cause cancer based upon animal studies. May cause chronic heart disease due to effects on the heart muscle.

Section 4 - First Aid Measures

Eyes: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical aid.

Skin: In case of contact, immediately flush skin with soap and plenty of water. Remove contaminated clothing and shoes. Get medical aid if symptoms occur. Wash clothing before reuse.

Ingestion: If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Runoff from fire control or dilution water may cause pollution.

Extinguishing Media: Use extinguishing media most appropriate for the surrounding fire.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Store protected from moisture.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Cobalt oxide Co ₃ O ₄	0.02 mg/m ³ TWA (as Co) (listed under Cobalt, inorganic compounds).	none listed	none listed
Cobalt(II) oxide	0.02 mg/m ³ TWA (as Co) (listed under Cobalt, inorganic compounds).	none listed	none listed

OSHA Vacated PELs: Cobalt oxide Co₃O₄: No OSHA Vacated PELs are listed for this chemical. Cobalt(II) oxide: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Crystalline powder

Appearance: black-gray

Odor: Not available.
pH: Not available.
Vapor Pressure: Not applicable.
Vapor Density: Not applicable.
Evaporation Rate: Not available.
Viscosity: Not available.
Boiling Point: Not available.
Freezing/Melting Point: 895 deg C
Decomposition Temperature: 895 deg C
Solubility: insoluble
Specific Gravity/Density: 6.11 g /cm³
Molecular Formula: O₄Co₃
Molecular Weight: 240.80

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions.

Conditions to Avoid: Dust generation, moisture, excess heat.

Incompatibilities with Other Materials: No information found..

Hazardous Decomposition Products: Cobalt/cobalt oxides.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 1308-06-1: GG2500000

CAS# 1307-96-6: GG2800000

LD50/LC50:

CAS# 1308-06-1:

Oral, rat: LD50 = >5 gm/kg;

CAS# 1307-96-6:

Oral, rat: LD50 = 202 mg/kg;

Oral, rat: LD50 = 202 mg/kg;

Carcinogenicity:

CAS# 1308-06-1:

- **ACGIH:** A3 - Confirmed animal carcinogen with unknown relevance to humans (listed as 'Cobalt, inorganic compounds').
- **California:** Not listed.

- **NTP:** Not listed.
- **IARC:** Group 2B carcinogen

CAS# 1307-96-6:

- **ACGIH:** A3 - Confirmed animal carcinogen with unknown relevance to humans (listed as 'Cobalt, inorganic compounds').
- **California:** carcinogen, initial date 7/1/92
- **NTP:** Not listed.
- **IARC:** Group 2B carcinogen

Epidemiology: See entry in the Documentation of the Threshold Limit Values and Biological Exposure Indices issued by ACGIH.

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: Cobalt uptake and phytotoxicity are affected by soil pH. More acidic soils absorb cobalt less strongly.

Physical: No information available.

Other: No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		

UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 1308-06-1 is listed on the TSCA inventory.

CAS# 1307-96-6 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 1308-06-1: immediate, delayed.

Section 313

This material contains Cobalt oxide Co₃O₄ (listed as Cobalt compounds), 100%, (CAS# 1308-06-1) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

This material contains Cobalt(II) oxide (listed as Cobalt compounds), -%, (CAS# 1307-96-6) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

CAS# 1308-06-1 (listed as Cobalt compounds) is listed as a hazardous air pollutant (HAP).

CAS# 1307-96-6 (listed as Cobalt compounds) is listed as a hazardous air pollutant (HAP).

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 1308-06-1 can be found on the following state right to know lists: New Jersey,

(listed as Cobalt compounds), Pennsylvania, (listed as Cobalt compounds), Minnesota, (listed as Cobalt, inorganic compounds).

CAS# 1307-96-6 can be found on the following state right to know lists: New Jersey, (listed as Cobalt compounds), Pennsylvania, (listed as Cobalt compounds), Minnesota, (listed as Cobalt, inorganic compounds).

California Prop 65

WARNING: This product contains Cobalt(II) oxide, a chemical known to the state of California to cause cancer.

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XN N

Risk Phrases:

R 22 Harmful if swallowed.

R 43 May cause sensitization by skin contact.

R 50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Phrases:

S 22 Do not breathe dust.

S 24 Avoid contact with skin.

S 37 Wear suitable gloves.

S 60 This material and its container must be disposed of as hazardous waste.

S 61 Avoid release to the environment. Refer to special instructions /safety data sheets.

WGK (Water Danger/Protection)

CAS# 1308-06-1: 0

CAS# 1307-96-6: 2

Canada - DSL/NDSL

CAS# 1308-06-1 is listed on Canada's DSL List.

CAS# 1307-96-6 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B, D2A.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 1308-06-1 is not listed on the Canadian Ingredient Disclosure List.

CAS# 1307-96-6 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Cobalt(II) Chloride Hexahydrate

ACC# 05345

Section 1 - Chemical Product and Company Identification

MSDS Name: Cobalt(II) Chloride Hexahydrate

Catalog Numbers: AC192090000, AC192090010, AC192091000, AC192092500, AC192860000, AC192860250, AC423570000, AC423570050, S71930, S72893, S75089, S93179, 42357-1000, 42357-5000, C371-100, C371-500, C371500LC

Synonyms: Cobaltous chloride hexahydrate; Cobalt muriate hexahydrate.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7791-13-1	Cobalt(II) chloride hexahydrate	100	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: purple solid.

Warning! Causes irritation and possible burns by all routes of exposure. Possible cancer hazard. May cause cancer based on animal data. May cause allergic respiratory and skin reaction. Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. May be harmful if swallowed. May cause blood abnormalities. May cause lung damage. May cause adverse reproductive effects. Dangerous for the environment.

Target Organs: Lungs, cardiovascular system, red blood cells, skin, male reproductive system.

Potential Health Effects

Eye: Causes eye irritation and possible burns.

Skin: May cause skin sensitization, an allergic reaction, which becomes evident upon re-exposure to this material. Causes skin irritation and possible burns.

Ingestion: May interfere with blood clotting. May cause thyroid abnormalities. Causes digestive tract irritation with possible burns.

Inhalation: Causes delayed lung injury. May cause asthmatic attacks due to allergic sensitization of the respiratory tract. May cause asthma and shortness of breath. Causes respiratory tract irritation with possible burns.

Chronic: Cobalt compounds may cause cancer based upon animal studies. Adverse reproductive effects have been reported in animals.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If breathing is difficult, give oxygen. Get medical aid. Do NOT use mouth-to-mouth resuscitation.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Non-combustible, substance itself does not burn but may decompose upon heating to produce irritating, corrosive and/or toxic fumes.

Extinguishing Media: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire.

Flash Point: Noncombustible.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 3; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with skin and eyes. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Cobalt(II) chloride hexahydrate	0.02 mg/m ³ TWA (as Co) (listed under Cobalt, inorganic compounds).	none listed	none listed
Cobalt dichloride anhydrous	0.02 mg/m ³ TWA (as Co) (listed under Cobalt, inorganic compounds).	none listed	none listed

OSHA Vacated PELs: Cobalt(II) chloride hexahydrate: No OSHA Vacated PELs are listed for this chemical. Cobalt dichloride anhydrous: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid
Appearance: purple
Odor: none reported
pH: 4.6 @ M solution.
Vapor Pressure: Negligible.
Vapor Density: Not available.
Evaporation Rate: Negligible.
Viscosity: Not available.
Boiling Point: 1048.9 deg C
Freezing/Melting Point: 87 deg C
Decomposition Temperature: 110 deg C
Solubility: 77 g/100ml (0 C)
Specific Gravity/Density: 1.924
Molecular Formula: CoCl₂·6H₂O
Molecular Weight: 237.9196

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions.

Conditions to Avoid: Dust generation, moisture, excess heat.

Incompatibilities with Other Materials: Strong oxidizers and alkali metals. Absorbs NH₃ from air.

Hazardous Decomposition Products: Hydrogen chloride, cobalt/cobalt oxides.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 7791-13-1: GG0200000

CAS# 7646-79-9: GF9800000

LD50/LC50:

CAS# 7791-13-1:

Oral, rat: LD50 = 766 mg/kg;

Skin, rat: LD50 = >2 gm/kg;

CAS# 7646-79-9:

Oral, mouse: LD50 = 80 mg/kg;

Oral, rat: LD50 = 80 mg/kg;

Oral, rat: LD50 = 418 mg/kg;

Reproductive hazard: Mouse: Oral Dose: 182 mg/kg (13 Weeks, Male) Paternal effects: Testes, epididymis, sperm duct.

Carcinogenicity:

CAS# 7791-13-1:

- **ACGIH:** A3 - Confirmed animal carcinogen with unknown relevance to humans (listed as 'Cobalt, inorganic compounds').
- **California:** Not listed.
- **NTP:** Not listed.
- **IARC:** Group 2B carcinogen

CAS# 7646-79-9:

- **ACGIH:** A3 - Confirmed animal carcinogen with unknown relevance to humans (listed as 'Cobalt, inorganic compounds').
- **California:** Not listed.
- **NTP:** Not listed.
- **IARC:** Group 2B carcinogen

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: Adverse reproductive effects have occurred in experimental animals.

Mutagenicity: Mutagenic effects have occurred in experimental animals.

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	CORROSIVE SOLID, ACIDIC, INORGANIC, N.O. (COBALTOUS CHLORIDE)	CORROSIVE SOLID, ACIDIC, INORGANIC, N.O. (COBALTOUS CHLORIDE)
Hazard Class:	8	8
UN Number:	UN3260	UN3260
Packing Group:	II	II

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7791-13-1 is not on the TSCA Inventory because it is a hydrate. It is considered to be listed if the CAS number for the anhydrous form is on the inventory (40CFR720.3(u)(2)).

CAS# 7646-79-9 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 7791-13-1: immediate, delayed.

CAS # 7646-79-9: immediate, delayed.

Section 313

This material contains Cobalt(II) chloride hexahydrate (listed as Cobalt, inorganic compounds), 100%, (CAS# 7791-13-1) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

This material contains Cobalt dichloride anhydrous (listed as Cobalt, inorganic compounds), -%, (CAS# 7646-79-9) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

CAS# 7791-13-1 (listed as Cobalt compounds) is listed as a hazardous air pollutant (HAP).

CAS# 7646-79-9 (listed as Cobalt compounds) is listed as a hazardous air pollutant (HAP).

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7791-13-1 can be found on the following state right to know lists: New Jersey, (listed as Cobalt compounds), Pennsylvania, (listed as Cobalt compounds), Minnesota, (listed as Cobalt, inorganic compounds).

CAS# 7646-79-9 can be found on the following state right to know lists: New Jersey, (listed as Cobalt compounds), Pennsylvania, (listed as Cobalt compounds), Minnesota, (listed as Cobalt, inorganic compounds).

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

T N

Risk Phrases:

R 22 Harmful if swallowed.

R 42/43 May cause sensitization by inhalation and skin contact.

R 49 May cause cancer by inhalation.

R 50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Phrases:

S 22 Do not breathe dust.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 53 Avoid exposure - obtain special instructions before use.

S 60 This material and its container must be disposed of as hazardous waste.

S 61 Avoid release to the environment. Refer to special instructions /safety data sheets.

WGK (Water Danger/Protection)

CAS# 7791-13-1: 2

CAS# 7646-79-9: 2

Canada - DSL/NDSL

CAS# 7646-79-9 is listed on Canada's DSL List.

Canada - WHMIS

not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 7791-13-1 is not listed on the Canadian Ingredient Disclosure List.

CAS# 7646-79-9 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Congo Red

ACC# 60200

Section 1 - Chemical Product and Company Identification

MSDS Name: Congo Red

Catalog Numbers: AC110500000, AC110500010, AC110501000, AC110502500, AC110505000, AC229620000, AC229620050, AC229620250, AC405360000, AC405360250, S70401, S704011, S71402, C580-25

Synonyms: C.I. Direct Red 28; Atlantic Congo Red; C.I. 22120; Diacotton Congo Red; Benzo Congo Red.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
573-58-0	C.I. Direct Red 28	100	209-358-4

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: dark red-brown solid.

Warning! Flammable solid. Causes eye irritation. May cause skin and respiratory tract irritation. Possible risk of harm to the unborn child. May cause cancer in humans. May cause central nervous system effects.

Target Organs: Central nervous system, bladder.

Potential Health Effects

Eye: Causes eye irritation. May cause lacrimation (tearing), blurred vision, and photophobia. May cause chemical conjunctivitis and corneal damage.

Skin: May cause skin irritation. May cause skin sensitization, an allergic reaction, which becomes evident upon re-exposure to this material. May cause skin irritation and possible burns.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. May cause nausea, vomiting, abdominal pain, and increased salivation.

Inhalation: May cause respiratory tract irritation. Olfactory fatigue may occur. Can produce delayed pulmonary edema.

Chronic: This product is a chemical derivative of benzidine, a known human carcinogen. This substance has caused adverse reproductive and fetal effects in laboratory animals. The primary target organs for carcinogenicity induced by benzidine vary with species. Rats, mice, and hamsters develop liver and mammary tumors. Dogs and humans develop increased incidences of urinary bladder cancer.

Section 4 - First Aid Measures

Eyes: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical aid.

Skin: In case of contact, flush skin with plenty of water. Remove contaminated clothing and shoes. Get medical aid if irritation develops and persists. Wash clothing before reuse.

Ingestion: If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. This material in sufficient quantity and reduced particle size is capable of creating a dust explosion. Flammable solid. May burn rapidly with flare burning effect. May re-ignite after fire is extinguished.

Extinguishing Media: Contact professional fire-fighters immediately. Cool containers with flooding quantities of water until well after fire is out. Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 2; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Scoop up with a nonsparking tool, then place into a suitable container for disposal. Avoid generating dusty conditions. Remove all sources of ignition. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Keep container tightly closed. Keep away from heat, sparks and flame. Avoid ingestion and inhalation. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames.

Storage: Keep away from heat, sparks, and flame. Keep away from sources of ignition. Store in a cool, dry place. Keep containers tightly closed.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low. Use adequate general or local explosion-proof ventilation to keep airborne levels to acceptable levels.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
C.I. Direct Red 28	none listed	none listed	none listed

OSHA Vacated PELs: C.I. Direct Red 28: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: dark red-brown

Odor: odorless

pH: 8-9.5 (aq soln)

Vapor Pressure: Negligible.

Vapor Density: Not available.

Evaporation Rate: Negligible.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: > 360 deg C

Decomposition Temperature: Not available.

Solubility: Soluble.

Specific Gravity/Density: Not available.

Molecular Formula: C₃₂H₂₂N₆O₆S₂Na₂

Molecular Weight: 696.67

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions. Materials containing similar functional groups can decompose at elevated temperatures.

Conditions to Avoid: Incompatible materials, ignition sources, dust generation, excess heat.

Incompatibilities with Other Materials: Strong oxidizing agents, strong acids.

Hazardous Decomposition Products: Carbon monoxide, oxides of nitrogen, oxides of sulfur, carbon dioxide.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 573-58-0: QK1400000

LD50/LC50:

CAS# 573-58-0:

Draize test, rabbit, eye: 100 mg Moderate;

Oral, rat: LD50 = 15200 mg/kg;

Carcinogenicity:

CAS# 573-58-0:

- **ACGIH:** Not listed.
- **California:** carcinogen, initial date 10/1/92 (listed as Benzidine based dyes).
- **NTP:** Known carcinogen (listed as Benzidine based dyes).
- **IARC:** Group 2A carcinogen (listed as Benzidine based dyes).

Epidemiology: A strong association relating human exposure to benzidine based dyes with the subsequent development of bladder tumors was presented after a case-control mortality study of 200 bladder cancer patients in Japan. Patients were mostly kimono painters/dyers

Teratogenicity: C.I. Direct Black 38, a benzidine-based dye, was evaluated for developmental toxicity. All dose levels caused a significant increase in the average % of malformed fetuses. Malformed centra were significantly increased at 200 mg/kg/day and above.

Reproductive Effects: In mice and rats, prenatal exposure to the dye Congo red, a benzidine-based dye, permanently reduces the number of germ cells in male and female offspring. In 1 study, the administration of benzidine to pregnant mice produced liver tumors in the offspring. Oral doses of benzidine-based dyes to pregnant mice on Day 8-12 of gestation altered testicular development & caused hypospermatogenesis during adulthood

Mutagenicity: See actual entry in RTECS for complete information.

Neurotoxicity: No data available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	FLAMMABLE SOLIDS, ORGANIC, N.O.S.	FLAMMABLE SOLIDS, ORGANIC, N.O.S.
Hazard Class:	4.1	4.1

UN Number:	UN1325	UN1325
Packing Group:	II	II

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 573-58-0 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

CAS# 573-58-0: Section 5

TSCA Significant New Use Rule

CAS# 573-58-0: This product is for research and development use only. It is subject to a SNUR which has specific requirements and restrictions. The specific citation for this product is 4040 CFR 721.1660.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 573-58-0: immediate, delayed.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 573-58-0 can be found on the following state right to know lists: California, (listed as Benzidine based dyes), New Jersey, Minnesota, (listed as Benzidine based dyes).

California Prop 65

The following statement(s) is(are) made in order to comply with the California Safe Drinking Water Act:

WARNING: This product contains C.I. Direct Red 28, listed as 'Benzidine based dyes', a chemical known to the state of California to cause cancer.

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

T F

Risk Phrases:

- R 11 Highly flammable.
- R 45 May cause cancer.
- R 63 Possible risk of harm to the unborn child.

Safety Phrases:

- S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
- S 53 Avoid exposure - obtain special instructions before use.
- S 7 Keep container tightly closed.
- S 431 In case of fire, use dry chemical, CO₂, water spray or foam. (These chemicals have very low flashpoints and the use of water spray may be inefficient).

WGK (Water Danger/Protection)

CAS# 573-58-0: 1

Canada - DSL/NDSL

CAS# 573-58-0 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B, D2A.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 573-58-0 is not listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Copper (II) Sulfate Anhydrous

ACC# 05670

Section 1 - Chemical Product and Company Identification

MSDS Name: Copper (II) Sulfate Anhydrous

Catalog Numbers: S93223, S93224, S93225, C495-500

Synonyms: Copper monosulfate; Cupric sulfate; Cupric sulfate anhydrous; Sulfuric acid, copper(2+) salt (1:1).

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7758-98-7	Copper(II) sulfate	>97	231-847-6

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: light gray powder.

Warning! Harmful if swallowed. Causes eye and skin irritation and possible burns. Causes digestive and respiratory tract irritation with possible burns. Hygroscopic (absorbs moisture from the air). Severe marine pollutant.

Target Organs: Blood, kidneys, liver.

Potential Health Effects

Eye: Exposure to particulates or solution may cause conjunctivitis, ulceration, and corneal abnormalities. Causes eye irritation and possible burns.

Skin: Causes skin irritation and possible burns.

Ingestion: Harmful if swallowed. May cause severe gastrointestinal tract irritation with

nausea, vomiting and possible burns. Ingestion of large amounts of copper salts may cause bloody stools and vomit, low blood pressure, jaundice and coma. Ingestion of copper compounds may produce systemic toxic effects to the kidney and liver and central nervous excitation followed by depression.

Inhalation: May cause ulceration and perforation of the nasal septum if inhaled in excessive quantities. Causes respiratory tract irritation with possible burns.

Chronic: May cause liver and kidney damage. May cause anemia and other blood cell abnormalities. Individuals with Wilson's disease are unable to metabolize copper. Thus, copper accumulates in various tissues and may result in liver, kidney, and brain damage. Adverse reproductive effects have been reported in animals. Laboratory experiments have resulted in mutagenic effects. Chronic copper poisoning in man is recognized in the form of Wilson's disease.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation: Remove from exposure and move to fresh air immediately. If breathing is difficult, give oxygen. Get medical aid. Do NOT use mouth-to-mouth resuscitation. If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask.

Notes to Physician: Individuals with Wilson's disease are more susceptible to chronic copper poisoning.

Antidote: The use of d-Penicillamine as a chelating agent should be determined by qualified medical personnel.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Substance is noncombustible.

Extinguishing Media: Use extinguishing media most appropriate for the surrounding fire.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation. U.S. regulations require reporting spills and releases to soil, water and air in excess of reportable quantities.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid breathing dust.
Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Store protected from moisture.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Copper(II) sulfate	none listed	1 mg/m ³ TWA (as Cu, except Copper fume) (listed under Copper compounds, n.o.s.).	none listed

OSHA Vacated PELs: Copper(II) sulfate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and

ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Powder

Appearance: light gray

Odor: Odorless

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not applicable.

Evaporation Rate: Negligible.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 200 deg C

Decomposition Temperature: 560 deg C

Solubility: Soluble.

Specific Gravity/Density: 3.6

Molecular Formula: CuO₄S

Molecular Weight: 159.61

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions.

Conditions to Avoid: High temperatures, dust generation, exposure to moist air or water.

Incompatibilities with Other Materials: Aqueous solution of copper(2+) sulfate is an acid. Incompatible with strong bases, hydroxylamine, magnesium..

Hazardous Decomposition Products: Oxides of sulfur, copper fumes.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 7758-98-7: GL8800000

LD50/LC50:

CAS# 7758-98-7:

Oral, mouse: LD50 = 369 mg/kg;

Oral, mouse: LD50 = 87 mg/kg;

Oral, rat: LD50 = 300 mg/kg;

Oral, rat: LD50 = 960 mg/kg;

Carcinogenicity:

CAS# 7758-98-7: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: See actual entry in RTECS for complete information.

Reproductive Effects: See actual entry in RTECS for complete information.

Mutagenicity: See actual entry in RTECS for complete information.

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: Fish: Rainbow trout: LC50 = 0.1-2.5 mg/L; 96 Hr; UnspecifiedFish: Bluegill/Sunfish: LC50 = 0.6 mg/L; 48 Hr; 15 mg/L CaCO₃Fish: Bluegill/Sunfish: LC50 = 8.0 mg/L; 48 Hr; 68 mg/L CaCO₃Fish: Bluegill/Sunfish: LC50 = 10.0 mg/L; 48 Hr; 100 mg/L CaCO₃Fish: Bluegill/Sunfish: LC50 = 45.0 mg/L; 48 Hr; 132 mg/L CaCO₃ In soil, copper sulfate is partly washed down to lower levels, partly bound by soil components, and partly oxidatively transformed. Copper has a strong affinity for hydrous iron and manganese oxides, clays, carbonate minerals, and organic matter. Sorption to these materials ... suspended in the water column & in the bed sediments, results in relative enrichment of the solid phase and reduction in dissolved levels.

Environmental: Copper is accumulated by plants and animals, but it does not appear to biomagnify from plants to animals. This lack of biomagnification appears common with heavy metals. In air, copper aerosols (in general) have a residence time of 2 to 10 days in an unpolluted atmosphere and 0.1 to > 4 days in polluted, urban areas.

Physical: No evidence was found to indicate that there is any biotransformation process for copper compounds which would have a significant bearing on the fate of copper in aquatic environments.

Other: Has fungicidal properties.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	ENVIRONMENTALLY HAZARDOUS SUBSTANCES, SOLID, N.O.S.	ENVIRONMENTALLY HAZARDOUS
Hazard Class:	9	9
UN Number:	UN3077	UN3077
Packing Group:	III	III
Additional Info:		SUBSTANCES, SOLID, N.O.S.

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7758-98-7 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 7758-98-7: 10 lb final RQ; 4.54 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 7758-98-7: immediate.

Section 313

This material contains Copper(II) sulfate (listed as Copper compounds, n.o.s.), >97%, (CAS# 7758-98-7) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

CAS# 7758-98-7 is listed as a Hazardous Substance under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

CAS# 7758-98-7 is listed as a Toxic Pollutant under the Clean Water Act.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7758-98-7 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XN N

Risk Phrases:

R 22 Harmful if swallowed.

R 36/38 Irritating to eyes and skin.

R 50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Phrases:

S 22 Do not breathe dust.

S 60 This material and its container must be disposed of as hazardous waste.

S 61 Avoid release to the environment. Refer to special instructions /safety data sheets.

WGK (Water Danger/Protection)

CAS# 7758-98-7: 2

Canada - DSL/NDSL

CAS# 7758-98-7 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D1B, D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 7758-98-7 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Serotonin Creatinine Sulfate Monohydrate, 99%

ACC# 19973

Section 1 - Chemical Product and Company Identification

MSDS Name: Serotonin Creatinine Sulfate Monohydrate, 99%

Catalog Numbers: AC132680000, AC132680010, AC132680050

Synonyms: 5-Hydroxytryptamine Creatinine Sulfate Monohydrate.

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
61-47-2	Serotonin Creatinine Sulfate Monohydrate	99%	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: slightly beige crystalline powder.

Caution! May cause eye and skin irritation. May cause respiratory and digestive tract irritation. The toxicological properties of this material have not been fully investigated.

Target Organs: No data found.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation.

Ingestion: May cause irritation of the digestive tract. The toxicological properties of this substance have not been fully investigated.

Inhalation: May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Runoff from fire control or dilution water may cause pollution.

Extinguishing Media: Use agent most appropriate to extinguish fire. Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before

reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Keep container closed when not in use. Store in a tightly closed container. Keep refrigerated. (Store below 4°C/39°F.)

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Serotonin Creatinine Sulfate Monohydrate	none listed	none listed	none listed

OSHA Vacated PELs: Serotonin Creatinine Sulfate Monohydrate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Crystalline powder

Appearance: slightly beige

Odor: Not available.

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 216.00 - 219.00 deg C

Decomposition Temperature: Not available.

Solubility: Not available.

Specific Gravity/Density: Not available.
Molecular Formula: C₁₄H₁₉N₅O₂.H₂SO₄.H₂O
Molecular Weight: 405.42

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, dust generation, excess heat, strong oxidants.

Incompatibilities with Other Materials: Oxidizing agents.

Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, carbon monoxide, carbon dioxide, nitrogen gas, sulfur oxides (SO_x), including sulfur oxide and sulfur dioxide.

Hazardous Polymerization: Has not been reported

Section 11 - Toxicological Information

RTECS#:

CAS# 61-47-2 unlisted.

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 61-47-2: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 61-47-2 is not listed on the TSCA inventory. It is for research and development use only.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the

CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 61-47-2 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 61-47-2: No information available.

Canada - DSL/NDSL

None of the chemicals in this product are listed on the DSL or NDSL list.

Canada - WHMIS

WHMIS: Not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

p-Cresol

ACC# 17610

Section 1 - Chemical Product and Company Identification

MSDS Name: p-Cresol

Catalog Numbers: AC110590000, AC110590050, AC110591000, AC110595000, AC405740000, AC405740040 AC405740040, AC405740050, AC405741000, AC405745000

Synonyms: 4-Cresol; p-Cresylic Acid; 1-Hydroxy-4-Methylbenzene; p-Hydroxytoluene; 4-Hydroxytoluene; p-Methylphenol.

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
106-44-5	p-Cresol	>98	203-398-6

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: colorless to light yellow solid. Flash Point: 86.1 deg C.

Danger! Toxic. Causes eye and skin burns. Causes digestive and respiratory tract burns. May be fatal if inhaled. May cause allergic skin reaction. Harmful if swallowed or absorbed through the skin. May cause liver and kidney damage. Light sensitive. Material is a solid at room temperature that melts upon moderate heating into a combustible liquid with a flash point below 200°F(93.3°C). Hygroscopic (absorbs moisture from the air).

Target Organs: Kidneys, central nervous system, liver, respiratory system.

Potential Health Effects

Eye: Causes eye burns. May result in corneal injury. Contact with liquid is corrosive to the eyes and causes severe burns. May cause conjunctivitis and keratitis.

Skin: May be absorbed through the skin in harmful amounts. May cause skin sensitization, an allergic reaction, which becomes evident upon re-exposure to this material. Causes severe skin irritation and burns. Initial contact may cause prickling and intense burning.

Affected tissue may initially show white discoloration, wrinkling, and softening, which subsequently may become gangrenous.

Ingestion: May cause severe and permanent damage to the digestive tract. May cause vascular collapse and damage. Causes severe digestive tract burns with abdominal pain, vomiting, and possible death. May cause kidney, liver and spleen damage. Rapidly absorbed from the gastrointestinal tract. Cresols may cause abnormalities of the central nervous system, respiratory system, spleen and pancreas.

Inhalation: May be fatal if inhaled. Irritation may lead to chemical pneumonitis and pulmonary edema. May cause liver and kidney damage. Causes severe irritation of upper respiratory tract with coughing, burns, breathing difficulty, and possible coma. Causes chemical burns to the respiratory tract. May cause headache. May cause nausea and possible vomiting. Exposure to vapors or aerosols produced by high temperature processes may cause systemic absorption. If sufficient amounts are absorbed vascular collapse, shock, hypothermia, unconsciousness and respiratory failure are possible.

Chronic: May cause liver and kidney damage. Repeated exposure may cause sensitization dermatitis. May cause appetite loss, diarrhea, skin abnormalities, and digestive tract disturbances.

Section 4 - First Aid Measures

Eyes: Get medical aid immediately. Do NOT allow victim to rub eyes or keep eyes closed. Extensive irrigation with water is required (at least 30 minutes).

Skin: Get medical aid immediately. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Discard contaminated clothing in a manner which limits further exposure. Destroy contaminated shoes.

Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation: Get medical aid immediately. Remove from exposure and move to fresh air immediately. If breathing is difficult, give oxygen. Do NOT use mouth-to-mouth resuscitation. If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Water runoff can cause environmental damage. Dike and collect water used to fight fire. Vapors can travel to a source of ignition and flash back. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Vapors may be heavier than air. They can spread along the ground and collect in low or confined areas. May polymerize explosively when involved in a fire. Material is a solid at room temperature that melts upon moderate heating into a combustible liquid with a flash point below 200°F(93.3°C).

Extinguishing Media: For small fires, use dry chemical, carbon dioxide, or water spray. For large fires, use dry chemical, carbon dioxide, alcohol-resistant foam, or water spray.

Flash Point: 86.1 deg C (186.98 deg F)

Autoignition Temperature: 558.9 deg C (1,038.02 deg F)

Explosion Limits, Lower:1.1% @ 150C

Upper: Not available.

NFPA Rating: (estimated) Health: 3; Flammability: 2; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Wear a self contained breathing apparatus and appropriate personal protection. (See Exposure Controls, Personal Protection section). Remove all sources of ignition. Provide ventilation. Evacuate unnecessary personnel.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use only in a well-ventilated area. Minimize dust generation and accumulation. Ground and bond containers when transferring material. Do not get in eyes, on skin, or on clothing. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Keep container tightly closed. Do not ingest or inhale. Discard contaminated shoes. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames.

Storage: Keep away from sources of ignition. Keep container closed when not in use. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Corrosives area. If the water content is below approximately 0.3% and the temperature exceeds 268°F (120°C), violent corrosion of aluminum and its alloys may occur.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
p-Cresol	5 ppm TWA; Skin - potential significant contribution to overall exposure by the cutaneous route	2.3 ppm TWA; 10 mg/m ³ TWA 250 ppm IDLH	5 ppm TWA; 22 mg/m ³ TWA (listed under Cresol).

OSHA Vacated PELs: p-Cresol: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: colorless to light yellow

Odor: phenol-like

pH: Not available.

Vapor Pressure: 1 mm Hg @ 53 deg C

Vapor Density: 3.72 (air=1)

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: 202.2 deg C

Freezing/Melting Point: 35 deg C

Decomposition Temperature: Not available.

Solubility: 22.6g/L @ 40C.

Specific Gravity/Density: 1.03 (water=1)

Molecular Formula: C₇H₈O

Molecular Weight: 108.0554

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions. Low melting point solid.

Conditions to Avoid: Incompatible materials, light, ignition sources, excess heat.

Incompatibilities with Other Materials: Oxidizing agents, strong acids, bases, active metals, coatings, nitric acid, plastics, rubber, aliphatic amines, amides, chlorosulfonic acid,

oleum, alkalis.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide, cresol.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 106-44-5: GO6475000

LD50/LC50:

CAS# 106-44-5:

Draize test, rabbit, eye: 103 mg Severe;
Draize test, rabbit, skin: 517 mg/24H Severe;
Inhalation, rat: LC50 = >710 mg/m³/1H;
Inhalation, rat: LC50 = 29 mg/m³;
Oral, mouse: LD50 = 344 mg/kg;
Oral, mouse: LD50 = 160 mg/kg;
Oral, rabbit: LD50 = 620 mg/kg;
Oral, rat: LD50 = 207 mg/kg;
Oral, rat: LD50 = 270 mg/kg;
Skin, rabbit: LD50 = 301 mg/kg;
Skin, rabbit: LD50 = 301 mg/kg;
Skin, rat: LD50 = 750 mg/kg;
Skin, rat: LD50 = 750 mg/kg;

Carcinogenicity:

CAS# 106-44-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information available.

Reproductive Effects: No information found

Mutagenicity: No information available.

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: Fish: Fathead Minnow: LC50 = 19-28.6 mg/L; 96 Hr.; UnspecifiedFish: LC50 = 19-28.6 mg/L; 96 Hr.; UnspecifiedBacteria: Phytobacterium phosphoreum: EC50 = 1.6 mg/L; 15 Minutes; Microtox test Goldfish (soft water) TLm=49.1-19ppm/24-96H Bluegill (soft water) TLm=22.2-20.8ppm/24-96H Fathead minnow (hard water) TLm=18-13.4ppm/24-96H Guppy (hard water) TLm=18-50ppm/24-96H

Environmental: In air, substance will react with photochemically-produced hydroxyl radicals (day) and nitrate radicals (night). In water, substance will biodegrade within days. Substance is mobile in most soils and will biodegrade.

Physical: No information available.

Other: Please refer to the Handbook of Environmental Fate and Exposure Data (Vol 1) for additional information.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	CRESOLS, SOLID	CRESOLS, SOLID
Hazard Class:	6.1	6.1(8)
UN Number:	UN3455	UN3455
Packing Group:	II	II

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 106-44-5 is listed on the TSCA inventory.

Health & Safety Reporting List

CAS# 106-44-5: Effective 10/4/82, Sunset 10/4/92

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 106-44-5: 100 lb final RQ; 45.4 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 106-44-5: immediate, fire.

Section 313

This material contains p-Cresol (CAS# 106-44-5, >98%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

CAS# 106-44-5 is listed as a hazardous air pollutant (HAP).

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

CAS# 106-44-5 is listed as a Hazardous Substance under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 106-44-5 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, (listed as Cresol), Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

T C

Risk Phrases:

R 34 Causes burns.

R 24/25 Toxic in contact with skin and if swallowed.

Safety Phrases:

S 36/37/39 Wear suitable protective clothing, gloves and eye/face protection.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

WGK (Water Danger/Protection)

CAS# 106-44-5: 2

Canada - DSL/NDSL

CAS# 106-44-5 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of B3, D1A, E.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 106-44-5 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Cresol Red, indicator grade

ACC# 83307

Section 1 - Chemical Product and Company Identification

MSDS Name: Cresol Red, indicator grade

Catalog Numbers: AC151380000, AC151380050, AC151380250

Synonyms:

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
1733-12-6	Cresol Red	100	217-064-2

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: red-brown powder.

Caution! The toxicological properties of this material have not been fully investigated.

Target Organs: None known.

Potential Health Effects

Eye: No information regarding eye irritation and other potential effects was found.

Skin: No information regarding skin irritation and other potential effects was found.

Ingestion: The toxicological properties of this substance have not been fully investigated.

Inhalation: The toxicological properties of this substance have not been fully investigated.

Chronic: Not available.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media: Use agent most appropriate to extinguish fire.

Flash Point: Not applicable.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: ; Flammability: 1; Instability:

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use only in a well-ventilated area. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid breathing dust.

Storage: Store in a cool, dry place. Store in a tightly closed container.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate ventilation to keep airborne concentrations low.
Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Cresol Red	none listed	none listed	none listed

OSHA Vacated PELs: Cresol Red: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Powder

Appearance: red-brown

Odor: Not available.

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 290 deg C (dec.)

Decomposition Temperature: 290 deg C

Solubility: soluble

Specific Gravity/Density: Not available.

Molecular Formula: C₂₁H₁₈O₅S

Molecular Weight: 382.42

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Dust generation.

Incompatibilities with Other Materials: Strong oxidizing agents.

Hazardous Decomposition Products: Carbon monoxide, oxides of sulfur, carbon dioxide.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 1733-12-6 unlisted.

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 1733-12-6: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No data available.

Teratogenicity: No data available.

Reproductive Effects: No data available.

Mutagenicity: No data available.

Neurotoxicity: No data available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		

UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 1733-12-6 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 1733-12-6: immediate.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 1733-12-6 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 1733-12-6: 1

Canada - DSL/NDSL

CAS# 1733-12-6 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of Not controlled.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Crystal Violet

ACC# 91237

Section 1 - Chemical Product and Company Identification

MSDS Name: Crystal Violet

Catalog Numbers: 66761-5GGSS, 66761S

Synonyms: Crystal violet; Gentian Violet

Company Identification:

Fisher Diagnostics
Fisher Scientific Company, LLC
8365 Valley Pike
Middletown, VA 22645-0307

For information, call: 800-524-0294

Emergency Number: 800-524-0294

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
67-56-1	Methanol	<100.0	200-659-6
548-62-9	Crystal Violet	2.0	208-953-6

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: purple liquid. Flash Point: 52 deg F.

Danger! Poison! **Flammable liquid and vapor.** May be fatal or cause blindness if swallowed. Harmful if inhaled. May be harmful if absorbed through the skin. May cause eye and skin irritation. May cause respiratory tract irritation. May cause central nervous system depression. Eye contact may result in permanent eye damage. May cause liver and kidney damage. May cause fetal effects based upon animal studies. Cannot be made non-poisonous.

Target Organs: Kidneys, central nervous system, liver, eyes.

Potential Health Effects

Eye: Causes moderate eye irritation. Vapors may cause eye irritation. May cause painful

sensitization to light. This product contains a cationic dye. Similar dyes have caused permanent injury to the cornea and conjunctiva in documented exposure cases with human or rabbit eyes.

Skin: May cause skin irritation. May be absorbed through the skin in harmful amounts.

Ingestion: May cause irritation of the digestive tract. May cause respiratory failure. May cause vascular collapse and damage. May cause kidney failure.

Inhalation: May cause respiratory tract irritation. May cause visual impairment and possible permanent blindness. May cause effects similar to those described for ingestion.

Chronic: Prolonged or repeated skin contact may cause dermatitis. Chronic inhalation and ingestion may cause effects similar to those of acute inhalation and ingestion.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately. Do NOT allow victim to rub eyes or keep eyes closed. Extensive irrigation with water is required (at least 30 minutes).

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: Call a poison control center. If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Get medical aid immediately. Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

Notes to Physician: Effects may be delayed. Ethanol may inhibit methanol metabolism.

Section 5 - Fire Fighting Measures

General Information: Containers can build up pressure if exposed to heat and/or fire. As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Vapors can travel to a source of ignition and flash back. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Flammable Liquid. Can release vapors that form explosive mixtures at temperatures above the flashpoint.

Extinguishing Media: For small fires, use dry chemical, carbon dioxide, water spray or alcohol-resistant foam. Use water spray to cool fire-exposed containers. Water may be ineffective.

Flash Point: 52e deg F (11.11 deg C)

Autoignition Temperature: 876 deg F (468.89 deg C)

Explosion Limits, Lower:6.0%

Upper: 36.0%

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Scoop up with a nonsparking tool, then place into a suitable container for disposal. Use water spray to disperse the gas/vapor. Remove all sources of ignition. Absorb spill using an absorbent, non-combustible material such as earth, sand, or vermiculite. Do not use combustible materials such as sawdust.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Do not get on skin or in eyes. Do not ingest or inhale. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames.

Storage: Keep away from sources of ignition. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Methanol	200 ppm TWA; 250 ppm STEL; skin - potential for cutaneous absorption	200 ppm TWA; 260 mg/m ³ TWA 6000 ppm IDLH	200 ppm TWA; 260 mg/m ³ TWA
Crystal Violet	none listed	none listed	none listed

OSHA Vacated PELs: Methanol: 200 ppm TWA; 260 mg/m³ TWA Crystal Violet: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or

European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

Section 9 - Physical and Chemical Properties

Physical State: Liquid

Appearance: purple

Odor: alcohol-like

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: 1.1

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: 147 deg C

Freezing/Melting Point: Not available.

Decomposition Temperature: Not available.

Solubility: Soluble in water.

Specific Gravity/Density: 0.8

Molecular Formula: Mixture

Molecular Weight: Not available.

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions.

Conditions to Avoid: High temperatures, incompatible materials, ignition sources.

Incompatibilities with Other Materials: Oxidizing agents.

Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, carbon dioxide, formaldehyde, chloride fumes.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 67-56-1: PC1400000

CAS# 548-62-9: BO9000000

LD50/LC50:

CAS# 67-56-1:

Draize test, rabbit, eye: 40 mg Moderate;

Draize test, rabbit, eye: 100 mg/24H Moderate;

Draize test, rabbit, skin: 20 mg/24H Moderate;

Inhalation, rabbit: LC50 = 81000 mg/m³/14H;
Inhalation, rat: LC50 = 64000 ppm/4H;
Oral, mouse: LD50 = 7300 mg/kg;
Oral, rabbit: LD50 = 14200 mg/kg;
Oral, rat: LD50 = 5600 mg/kg;
Skin, rabbit: LD50 = 15800 mg/kg; <BR.

CAS# 548-62-9:

Oral, mouse: LD50 = 96 mg/kg;
Oral, rabbit: LD50 = 150 mg/kg;
Oral, rat: LD50 = 420 mg/kg; <BR.

Carcinogenicity:

CAS# 67-56-1: Not listed by ACGIH, IARC, NTP, or CA Prop 65.
CAS# 548-62-9: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Neurotoxicity: No information available.

Mutagenicity: No information available.

Other Studies: The toxicological properties have not been fully investigated.

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: CAS# 67-56-1: waste number U154 (Ignitable waste).

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	No information available.	No information available.
Hazard Class:		
UN Number:		

Packing Group:		
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Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 67-56-1 is listed on the TSCA inventory.

CAS# 548-62-9 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

SARA

CERCLA Hazardous Substances and corresponding RQs

CAS# 67-56-1: 5000 lb final RQ; 2270 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

SARA Codes

CAS # 67-56-1: acute, flammable. CAS # 548-62-9: acute.

Section 313

This material contains Methanol (CAS# 67-56-1, 100 0%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

CAS# 67-56-1 is listed as a hazardous air pollutant (HAP). This material does not contain any Class 1 Ozone depletors. This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 67-56-1 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

CAS# 548-62-9 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

T

Risk Phrases:

R 11 Highly flammable.

R 23/25 Toxic by inhalation and if swallowed.

Safety Phrases:

S 16 Keep away from sources of ignition - No smoking.

S 2 Keep out of reach of children.

S 24 Avoid contact with skin.

S 7 Keep container tightly closed.

WGK (Water Danger/Protection)

CAS# 67-56-1: 1

CAS# 548-62-9: 2

Canada - DSL/NDSL

CAS# 67-56-1 is listed on Canada's DSL List.

CAS# 548-62-9 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of B2, D1B.

Canadian Ingredient Disclosure List

CAS# 67-56-1 is listed on the Canadian Ingredient Disclosure List.

CAS# 548-62-9 is listed on the Canadian Ingredient Disclosure List.

FISHER SCIENTIFIC -- CUPRIC ACETATE -- 6810-00-270-3219

=====
Product Identification
=====

Product ID:CUPRIC ACETATE
MSDS Date:01/01/1987
FSC:6810
NIIN:00-270-3219
MSDS Number: BDRNZ
=== Responsible Party ===
Company Name:FISHER SCIENTIFIC
Emergency Phone Num:201-726-7100
CAGE:94480
=== Contractor Identification ===
Company Name:FISHER SCIENTIFIC COMPANY
Address:52 FADEM ROAD.DOMESTIC DIVISION
City:SPRINGFIELD
State:NJ
ZIP:07081
Country:US
Phone:201-796-7100
CAGE:94480

=====
Composition/Information on Ingredients
=====

Ingred Name:CUPRIC ACETATE CAS# 6046-93-1
CAS:6046-93-1
RTECS #:AG3500000
Fraction by Wt: 100%
ACGIH TLV:1MG(CU)/CUM

=====
Hazards Identification
=====

Effects of Overexposure:INHAL:IRRIT.RESP TRACT,HDCH,ULCER OR
PERFORATION OF NASAL SEPTUM.SKIN:IRRIT,PAIN.SEE OTHER PRECAUT.

=====
First Aid Measures
=====

First Aid:INHAL:REMOVE TO FRESH AIR.GIVE OXYG.KEEP QUIET & WARM.CALL
MD.SKIN:REMOVE CONTAM CLOTHING & SHOES.WASH W/SOAP & WATER FOR 20
MIN.CALL MD.EYE:WASH FOR 20 MIN.CALL MD.INGEST:IF CONSCIOUS & NO
CONVULSION S,GIVE 2-4 GLASS OF WATER.INDUCE VOMIT.CALL MD.

=====
Fire Fighting Measures
=====

Extinguishing Media:DRY CHEM,CO*2,WATER SPRAY OR FOAM
Fire Fighting Procedures:IF POSS,MOVE FROM FIRE AREA.USE SCBA W/FULL
FACE PIECE.
Unusual Fire/Explosion Hazard:FOR LG FIRE:USE WATER SPRAY,FOG OR
ALCOHOL FOAM.DO NOT SCATTER SPILL W/EXCESS WATER.SEE SUPP DATA.

=====
Accidental Release Measures
=====

Spill Release Procedures:SOIL:DIG PIT TO CONTAIN SPILL.DIKE SURFACE
FLOW W/SOIL,SANDBAGS,FOAMED POLYURETHANE OR CONCRETE.ABSORB LIQ
W/FLY ASH OR CEMENT POWDER.WATER:NEUTRALIZE TO PH7.ADD
CA(OCL)*2.OCCUPATIONL:KEEP AWAY FROM F LAME & IGNIT SOURCES.KEEP

AWAY FROM SEWERS.

=====
===== Handling and Storage =====

Handling and Storage Precautions:RESPIR PROTECT:@ 1MG(CU)/CUM,USE
SCBA,FUME PARTICULATE OR SUPPLIED-AIR RESPIR.@ 5MG(CU)/CUM,ALSO USE
FULL FACE-PIECE.SEE SUPP DATA.

Other Precautions:EFFECT OF OVEREXPO:EYE:REDNESS,CONJUNCTIVITIS,EDEMA
OF LIDS & CORNEAL ULCER.INGEST:BURN IN ESOPHAGUS,VOMIT,WATERY OR
BLOODY DIARR,KIDNEY & LIVER DAMAGE,HEMOLYSIS,COLLAPSE & CONVULSION.

=====
===== Exposure Controls/Personal Protection =====

Respiratory Protection:USE NIOSH/MSHA APPRVD EQUIPMENT (SEE OTHER PREC)
Ventilation:LOCAL EXHAUST OR GENERAL DILUTION SYSTEM.

Protective Gloves:RUBBER(PER MFR)

Eye Protection:SPLASH/DUST RESIST GOG

Other Protective Equipment:WEAR PROTECT CLOTHING & FACESHIELD.EYE WASH
FOUNTAIN.

Supplemental Safety and Health

MSDS PREP:85155.BP:240C DECOMP.FIRE HAZ:DIKE FIRE CONTROL WATER FOR
LATER DISPOSAL.RESPIR PROTECT:@ >100MG(CU)/CUM,USE POWDERED AIR
PURIFYING OR TYPE C SUPPLIED-AIR RESPIR.

=====
===== Physical/Chemical Properties =====

HCC:N1

Boiling Pt:B.P. Text:464F DECOMP

Spec Gravity:1.9

Solubility in Water:7.2%

Appearance and Odor:GREEN-BLUE PWDR OR SM CRYSTALS.ACETIC ACID ODOR.

=====
===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES

Hazardous Decomposition Products:ACETONE,ACRID SMOKE & IRRIT FUMES

=====
===== Disposal Considerations =====

Waste Disposal Methods:SWEEP UP & PLACE IN FIBERBOARD CONTAINERS.USE
DREDGE OR LIFT TO EXTRACT IMMOBILIZED MASSES.DISPOSE IN ACCORDANCE
W/LOCAL,STATE & FEDERAL REGULATIONS.

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assume responsibility for the suitability of this information to their
particular situation.

Material Safety Data Sheet

Cupric Nitrate Trihydrate

ACC# 05645

Section 1 - Chemical Product and Company Identification

MSDS Name: Cupric Nitrate Trihydrate

Catalog Numbers: S73208, S73211-1, S93221

Synonyms: Copper(II) nitrate trihydrate; Nitric acid, copper salt, trihydrate.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
10031-43-3	Cupric nitrate trihydrate	100	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: blue solid.

Danger! Strong oxidizer. Contact with other material may cause a fire. May be harmful if swallowed. Causes severe respiratory tract irritation. May cause severe eye and skin irritation with possible burns. Causes severe digestive tract irritation with pain, nausea, vomiting and diarrhea. May corrode the digestive tract with hemorrhaging and possible shock. May cause liver and kidney damage. May cause dermatitis.

Target Organs: Kidneys, liver.

Potential Health Effects

Eye: Contact with eyes may cause severe irritation, and possible eye burns. Contact may cause ulceration of the conjunctiva and cornea.

Skin: May cause severe irritation and possible burns. May cause dermatitis. May cause skin

discoloration.

Ingestion: May cause severe gastrointestinal tract irritation with nausea, vomiting and possible burns. May cause liver and kidney damage. May cause hemorrhaging of the digestive tract.

Inhalation: May cause methemoglobinemia, cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood), convulsions, tachycardia, dyspnea (labored breathing), and death. May cause ulceration and perforation of the nasal septum if inhaled in excessive quantities. May cause severe irritation of the upper respiratory tract with pain, burns, and inflammation.

Chronic: Chronic inhalation and ingestion may cause effects similar to those of acute inhalation and ingestion. May cause liver and kidney damage. Individuals with Wilson's disease are unable to metabolize copper. Thus, copper accumulates in various tissues and may result in liver, kidney, and brain damage.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Get medical aid immediately. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Call a poison control center. If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Get medical aid immediately. Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

Notes to Physician: Treat symptomatically and supportively.

Antidote: The use of d-Penicillamine as a chelating agent should be determined by qualified medical personnel.

Section 5 - Fire Fighting Measures

General Information: Strong oxidizer. Contact with other material may cause fire. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Wear appropriate protective clothing to prevent contact with skin and eyes. Wear a self-contained breathing apparatus (SCBA) to prevent contact with thermal decomposition products.

Extinguishing Media: Use extinguishing media most appropriate for the surrounding fire.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0; Special Hazard: OX

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Minimize dust generation and accumulation. Contents may develop pressure upon prolonged storage. Keep away from heat, sparks and flame. Avoid contact with clothing and other combustible materials. Do not get on skin or in eyes. Do not ingest or inhale.

Storage: Keep away from heat, sparks, and flame. Do not store near combustible materials. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Local exhaust ventilation may be necessary to control any air contaminants to within their TLVs during the use of this product. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Cupric nitrate trihydrate	none listed	1 mg/m ³ TWA (as Cu, except Copper fume) (listed under Copper compounds, n.o.s.).	none listed
Cupric nitrate	none listed	none listed	none listed

OSHA Vacated PELs: Cupric nitrate trihydrate: No OSHA Vacated PELs are listed for this chemical. Cupric nitrate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid
Appearance: blue
Odor: odorless
pH: 4.0 for 0.2M soln.
Vapor Pressure: Not applicable.
Vapor Density: 8.33
Evaporation Rate: Not applicable.
Viscosity: Not available.
Boiling Point: Not applicable.
Freezing/Melting Point: 114.4 deg C
Decomposition Temperature: Not available.
Solubility: Soluble in water.
Specific Gravity/Density: 2.05
Molecular Formula: $\text{Cu}(\text{NO}_3)_2 \cdot 3\text{H}_2\text{O}$
Molecular Weight: 241.60

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions.
Conditions to Avoid: Incompatible materials, combustible materials, reducing agents, organic matter.
Incompatibilities with Other Materials: Reducing agents, combustible materials, potassium ferrocyanide, ether, tin. Ignites paper spontaneously in the presence of moisture.
Hazardous Decomposition Products: Oxides of nitrogen, irritating and toxic fumes and gases, copper fumes.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 10031-43-3: GL7875000
CAS# 3251-23-8: QU7400000
LD50/LC50:
CAS# 10031-43-3:

Oral, rat: LD50 = 940 mg/kg;

CAS# 3251-23-8:

Draize test, rabbit, eye: 100 mg Severe;

Draize test, rabbit, skin: 500 mg Severe;

Oral, mouse: LD50 = 430 mg/kg;

Oral, rat: LD50 = 794 mg/kg;

Oral, rat: LD50 = 940 mg/kg;

Carcinogenicity:

CAS# 10031-43-3: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 3251-23-8: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: No information available.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	NITRATES, INORGANIC, N.O.S.	NITRATES ORGANIC NOS (CUPRIC NITRATE)
Hazard Class:	5.1	5.1
UN Number:	UN1477	UN1477

Packing Group:	II	II
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Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 10031-43-3 is not on the TSCA Inventory because it is a hydrate. It is considered to be listed if the CAS number for the anhydrous form is on the inventory (40CFR720.3(u)(2)).

CAS# 3251-23-8 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 3251-23-8: 100 lb final RQ; 45.4 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 10031-43-3: immediate, delayed, fire.

CAS # 3251-23-8: immediate, delayed, fire.

Section 313

This material contains Cupric nitrate trihydrate (listed as Copper compounds, n.o.s.), 100%, (CAS# 10031-43-3) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

This material contains Cupric nitrate (listed as Water Dissociable Nitrate Compounds), - %, (CAS# 3251-23-8) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

CAS# 3251-23-8 is listed as a Hazardous Substance under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

CAS# 10031-43-3 is listed as a Toxic Pollutant under the Clean Water Act.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 10031-43-3 can be found on the following state right to know lists: California, (listed as Copper compounds, n.o.s.), New Jersey, (listed as Copper compounds, n.o.s.), Pennsylvania, (listed as Copper compounds, n.o.s.).

CAS# 3251-23-8 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations European Labeling in Accordance with EC Directives

Hazard Symbols:

XN O

Risk Phrases:

R 22 Harmful if swallowed.

R 36/38 Irritating to eyes and skin.

R 8 Contact with combustible material may cause fire.

Safety Phrases:

WGK (Water Danger/Protection)

CAS# 10031-43-3: 2

CAS# 3251-23-8: No information available.

Canada - DSL/NDSL

CAS# 3251-23-8 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of C, D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 10031-43-3 (listed as Copper compounds, n.o.s.) is listed on the Canadian Ingredient Disclosure List.

CAS# 3251-23-8 is listed on the Canadian Ingredient Disclosure List.

FISHER SCIENTIFIC -- CUPRIC OXIDE -- 6810-00-300-6193

=====
===== Product Identification =====

Product ID:CUPRIC OXIDE
MSDS Date:04/11/1991
FSC:6810
NIIN:00-300-6193
MSDS Number: BSYH
=== Responsible Party ===
Company Name:FISHER SCIENTIFIC
Address:1 REAGENT LANE
City:FAIR LAWN
State:NJ
ZIP:07410
Country:US
Info Phone Num:201-796-7100
Emergency Phone Num:201-796-7100
CAGE:1B464
=== Contractor Identification ===
Company Name:FISHER SCIENTIFIC CO. CHEMICAL MFG DIV
Address:1 REAGENT LANE
Box:City:FAIRLAWN
State:NJ
ZIP:07410-2802
Country:US
Phone:201-796-7100
CAGE:1B464

=====
===== Composition/Information on Ingredients =====

Ingred Name:COPPER OXIDE (CUPRIC OXIDE)
CAS:1317-38-0
RTECS #:GL7900000
Fraction by Wt: 100%
OSHA PEL:1 MG/M3 FUME (CU)
ACGIH TLV:1 MG/M3 FUME (CU)

Ingred Name:SUPP DATA:HAS RSLTD IN IRRIT, NECROSIS, & GREENISH SKIN
DISCOLORATION. ALLERGIC CNTCT DERM, ALTHOUGH RARE, HAS (ING 3)
RTECS #:9999999ZZ

Ingred Name:ING 2:BEEN REPORTED. EYE:ACUTE:CNTCT MAY CAUSE IRRIT. SOME
COPPER SALTS HAVE BEEN REPORTED TO CAUSE CONJUNC, (ING 4)
RTECS #:9999999ZZ

Ingred Name:ING 3:CORNEAL ULCERATIONS, & TURBIDITY POSS W/PALPEBRAL
EDEMA. COPPER PARTICLES EMBEDDED IN EYE MAY RESULT IN (ING 5)
RTECS #:9999999ZZ

Ingred Name:ING 4: A PRONOUNCED FOREIGN-BODY RESPONSE W/CHRACTERISTIC
DISCOLORATION OF OCULAR TISSUE. CHRONIC: RPTD/PRLNGD (ING 6)
RTECS #:9999999ZZ

Ingred Name:ING 5:EXPOSURE TO IRRITANTS MAY CAUSE CONJUCTIVITIS.
INGEST: ACUTE:INGEST OF COPPER SALTS MAY CAUSE AN IMMED (ING 7)
RTECS #:9999999ZZ

Ingred Name:ING 6:METALLIC TASTE, SALIVATION, NAUSEA, EPIGASTRIC
BURNING, VOMITING, DIARRHEA, ULCERS, HEMORRHAGIC GASTRITIS, (ING 8)
RTECS #:9999999ZZ

Ingred Name:ING 7: ANURIA, COMA, CONVULSIONS AND DEATH. CHRONIC:
REPEATED OR PROLONGED EXPOSURE TO COPPER SALTS HAS PRODUCED(ING 9)
RTECS #:9999999ZZ

Ingred Name:ING 8:HEMOLYTIC ANEMIA AND LIVER, KIDNEY, AND SPLEEN DAMAGE
IN ANIMALS.
RTECS #:9999999ZZ

Ingred Name:FIRST AID PROC: WATER OR NORMAL SALINE SOLN FOR AT LEAST 15
MIN, OCCASIONALLY LIFTING UPPER & LOWER LIDS, UNTIL (ING 11)
RTECS #:9999999ZZ

Ingred Name:ING 10: NO EVIDENCE OF CHEMICAL REMAINS (APPROX 15-20 MIN).
GET MED ATTN IMMED. INGEST: DILUTE POIS IMMED W/LRG (ING 12)
RTECS #:9999999ZZ

Ingred Name:ING 11: AMTS OF WATER OR MILK AND REMOVE BY GASTRIC LAVAGE
UNLESS THE VICTIM IS ALREADY VOMITING. (DREISBACH, (ING 13)
RTECS #:9999999ZZ

Ingred Name:ING 12:HANDBOOK OF POISONING, 12TH ED).GET MED ATTN IMMED.
ADMIN OF GASTRIC LAVAGE SHLD BE PERFORMED BY QUALIFIED(ING14)
RTECS #:9999999ZZ

Ingred Name:ING 13: MEDICAL PERSONNEL. ANTIDOTE: THE FOLLOWING ANTIDOTE
HAS BEEN RECOMMENDED. HOWEVER, THE DECISION AS TO (ING 15)
RTECS #:9999999ZZ

Ingred Name:ING 14: WHETHER THE SEVERITY OF POISONING REQUIRES
ADMINISTRATION OF ANY ANTIDOTE AND ACTUAL DOSE REQUIRED SHLD (ING
16)
RTECS #:9999999ZZ

Ingred Name:ING 15:BE MADE BY QUALIFIED MED PERSONNEL. COPPER POIS:
GIVE CALCIUM DISODIUM EDETATE 15-25 MG/KG (0.08-0.125 ML(ING 17)
RTECS #:9999999ZZ

Ingred Name:ING 16:20% SOLN PER KG BODY WT) IN 250-500 ML 5% DEXTROSE
INTRAVENOUSLY OVER A 1-2 HR PERIOD TWICE DAILY. MAX (ING 18)
RTECS #:9999999ZZ

Ingred Name:ING 17: DOSE SHOULD NOT EXCEED 50 MG/KG/DAY, DRUG SHOULD BE
GIVEN IN 5-DAY COURSES W/A REST PERIOD OF @ LST 2 (ING 19)
RTECS #:9999999ZZ

Ingred Name:ING 18:DAYS BETWEEN COURSES. AFTER THE FIRST COURSE,
SUBSEQUENT COURSES SHLD NOT EXCEED 50 MG/KG/DAY. DAILY (ING 20)
RTECS #:9999999ZZ

Ingred Name:ING 19: URINALYSES SHOULD NOT BE DONE DURING TREATMENT
PERIOD. DOSAGE SHOULD BE REDUCED IF ANY UNUSUAL URINARY (ING 21)
RTECS #:9999999ZZ

Ingred Name:ING 20:FINDINGS APPEAR. IV ADMIN IS CONTRAINDICATED IN
PRESENCE OF ELEV CEREBROSPINAL FLUID PRESS. PENICILLAMINE(ING 22)
RTECS #:9999999ZZ

Ingred Name:ING 21: IS ALSO EFTIVE IN COPPER POIS. GIVE UP TO 100
MG/KG/DAY (MAX 1G/DAY) DIVIDED INTO 4 DOSES FOR NO LONGER (ING 23)
RTECS #:9999999ZZ

Ingred Name:ING 22: THAN 1 WK. IF LONGER ADMIN PERIOD IS WARRANTED,
DOSE SHOULD NOT EXCEED 40 MG/M3/DAY. GIVE DRUG ORALLY (ING 24)
RTECS #:9999999ZZ

Ingred Name:ING 23: 1/2 HR BEFORE MEALS. ANTIDOTE SHOULD BE AMIN BY
QUALIFIED MEDICAL PERSONNEL.
RTECS #:9999999ZZ

===== Hazards Identification =====

LD50 LC50 Mixture:NONE SPECIFIED BY MANUFACTURER.
Routes of Entry: Inhalation:YES Skin:NO Ingestion:NO
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:INHAL:ACUTE:INHAL OF COPPER DUST MAY
CAUSE IRRIT OF UPPER RESP TRACT/AN ILLNESS SIMILAR TO COMMON COLD
W/SENS OF CHILLS & STUFFINESS OF THE HEAD. CHRONIC:PRLNGD INHAL OF
DUST/MIST OF COPPER SALTS MAY CAUSE CONGESTION OF NASAL MUC MEMB,
SOMETIMES OF THE PHARYNX, & ON OCCASIONS ULCERATION & PERFORATION
(EFTS OF OVEREXP)
Explanation of Carcinogenicity:NOT RELEVANT
Effects of Overexposure:HLTH HAZ:OF NASAL SEPTUM. ATROPHIC CHANGES IN
THE MUC MEMB WERE NOTED IN SUBJECTS EXPOSED TO COMPLEX COPPER SALTS
FOR LONG PERIODS OF TIME. INHAL OF COPPER CMPNDS HAS CAUSED INJURY
TO LUNGS & LIVER W/ HEMOCHROMATOSIS IN ANIMALS. SKIN:ACUTE:MAY
CAUSE IRRIT. COPPER SALTS HAVE BEEN REPORTED TO CAUSE AN ITCHING
(SUPP DATA)
Medical Cond Aggravated by Exposure:PERSONS WITH PRE-EXISTING
RESPIRATORY, LIVER, SKIN, KIDNEY, HEMATOPOIETIC OR WILSON'S
DISEASE.

===== First Aid Measures =====

First Aid:INHAL:REMOVE FROM EXPOSURE TO FRESH AIR IMMED. IF BRTHG HAS
STOPPED, PERFORM ARTF RESP. KEEP PERSON WARM & AT REST. TREAT
SYMPTOMATICALLY & SUPPORTIVELY. GET MED ATTN IMMED. SKIN:REMOVE
CONTAM CLTHG & SHOES IMMED. WASH AFFECTED AREA W/SOAPOR MILD
DETERGENT & LRG AMTS OF WATER UNTIL NO EVIDENCE OF CHEM REMAINS
(APPROX 15-20 MIN). GET MED ATTN IMMED. EYE: WASH EYES IMMED W/LRG
AMTS OF (ING 10)

===== Fire Fighting Measures =====

Extinguishing Media:DRY CHEMICAL, CARBON DIOXIDE, WATER SPRAY OR FOAM.
LRG FIRES, USE WATER SPRAY, FOG OR ALCOHOL FOAM.
Fire Fighting Procedures:NO ACUTE HAZ. MOVE CNTNR FROM FIRE AREA IF
POSS. AVOID BRTHG VAPS OR DUSTS; KEEP UPWIND. WEAR NIOSH/MSHA
APPROVED SCBA AND FULL PROTECTIVE EQUIPMENT .
Unusual Fire/Explosion Hazard:NEGLIGIBLE FIRE HAZARD WHEN EXPOSED TO

HEAT OR FLAME.

===== Accidental Release Measures =====

Spill Release Procedures: OCCUPATIONAL SPILL: FOR LARGE SPILLS, SWEEP UP WITH A MINIMUM OF DUSTING AND PLACE INTO SUITABLE CLEAN, DRY CONTAINERS FOR RECLAMATION OR LATER DISPOSAL. RESIDUE SHLD BE CLEANED UP USING A HIGH-EFFICIENT PARTICULATE FILTER VACUUM.
Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.

===== Handling and Storage =====

Handling and Storage Precautions: OBSERVE ALL FEDERAL, STATE AND LOCAL REGULATIONS WHEN STORING OF THIS SUBSTANCE, FOR ASSISTANCE, CONTACT DISTRICT DIRECTOR OF EPA.
Other Precautions: NONE SPECIFIED BY MANUFACTURER.

===== Exposure Controls/Personal Protection =====

Respiratory Protection: THE SPECIFIC RESPIRATOR SELECTED MUST BE BASED ON CONTAM LEVELS FOUND IN THE WORK PLACE, MUST NOT EXCEED THE WORKING LIMITS OF THE RESP AND BE NIOSH/MSHA APPROVED. FOR SPECIFIC RESPIRATOR INFORMATION CONTACT NEHC .
Ventilation: PROVIDE LOCAL EXHAUST VENTILATION SYSTEM TO MEET PUBLISHED EXPOSURE LIMITS.
Protective Gloves: IMPERVIOUS GLOVES .
Eye Protection: ANSI APPROVED CHEM SAFETY GOGGLES .
Other Protective Equipment: EMERGENCY EYEWASH FOUNTAIN.
Work Hygienic Practices: NONE SPECIFIED BY MANUFACTURER.
Supplemental Safety and Health
MATERIALS TO AVOID: HYDROGEN SULFIDE, HYDROGEN TRISULFIDE, HYDROXYLAMINE, MAGNESIUM, PHOSPHAM, PHTHALIC ANHYDRIDE, POTASSIUM, RUBIDIUM ACETYLIDE & ACETYLENE CARBIDE, SODIUM, TITANIUM, ZIRCONIUM. EFFECTS OF OVER EXPOSURE: PULMONARY, SKIN DISCOLORATION & ECZEMATOID LESIONS.
CHRONIC: REPRODUCED CONTACT WITH SOME COPPER SALTS (INGESTION)

===== Physical/Chemical Properties =====

Melt/Freeze Pt: M.P/F.P Text: 2419F, 1326C
Spec Gravity: 6.3-6.49
Solubility in Water: INSOLUBLE
Appearance and Odor: BLACK TO BROWNISH-BLACK CRYSTALS OR POWDER.

===== Stability and Reactivity Data =====

ALUMINUM, ANILINIUM PERCHLORATE, BORON, CESIUM ACETYLENE CARBIDE, DICHLOROMETHYLSILANE, HYDRAZINE, HYDROGEN, (SUPPLEMENTAL DATA)
Stability Condition to Avoid: NONE REPORTED.
Hazardous Decomposition Products: THERMAL DECOMPOSITION MAY RELEASE TOXIC AND/OR HAZARDOUS GASES.

===== Disposal Considerations =====

Waste Disposal Methods: OBSERVE ALL FEDERAL, STATE AND LOCAL REGULATIONS WHEN STORING OR DISPOSING OF THIS SUBSTANCE. FOR ASSISTANCE, CONTACT THE DISTRICT DIRECTOR OF THE ENVIRONMENTAL PROTECTION AGENCY.

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SIGMA CHEMICAL CO -- CUPRIC SULFATE ANHYDROUS, C1297 -- 6505-00N062350

=====
Product Identification
=====

Product ID:CUPRIC SULFATE ANHYDROUS, C1297

MSDS Date:04/05/1991

FSC:6505

NIIN:00N062350

MSDS Number: BYFTL

=== Responsible Party ===

Company Name:SIGMA CHEMICAL CO

Box:14508

City:SAINT LOUIS

State:MO

ZIP:63178

Country:US

Info Phone Num:800-325-3010

Emergency Phone Num:314-771-5765

CAGE:0DK69

=== Contractor Identification ===

Company Name:ALDRICH CHEMICAL CO INC

Address:1001 WEST ST PAUL AVE

Box:355

City:MILWAUKEE

State:WI

ZIP:53233

Country:US

Phone:414-273-3850

CAGE:60928

Company Name:SIGMA CHEMICAL CO SIGMA DIAGNOSTICS DIV

Address:3050 SPRUCE ST

Box:City:ST LOUIS

State:MO

ZIP:63103-2530

Country:US

Phone:314-771-5765

CAGE:0DK69

=====
Composition/Information on Ingredients
=====

Ingred Name:COPPER (II) SULFATE (1:1) (SARA 313) (CERCLA)

CAS:7758-98-7

RTECS #:GL8800000

OSHA PEL:1 MG/M3 (CU)

ACGIH TLV:1 MG/M3 (CU)

EPA Rpt Qty:10 LBS

DOT Rpt Qty:10 LBS

=====
Hazards Identification
=====

LD50 LC50 Mixture:LD50:(ORAL,RAT) 300 MG/KG.

Routes of Entry: Inhalation:YES Skin:YES Ingestion:YES

Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO

Health Hazards Acute and Chronic:ACUTE:HARMFUL IF SWALLOWED,

INHALED/ABSORBED THRU SKIN. CAUSES SKIN IRRIT. CAUSES SEV EYE

IRRIT. MATL IS IRRIT TO MUC MEMBS & UPPER RESP TRACT. EXPOS CAN

CAUSE: DMG TO EYES, GI DISTURBS. CHRONIC:LAB E XPTS HAVE SHOWN

MUTAGENIC EFTS. TARGET ORGAN(S):LIVER, KIDNEYS, BLOOD. TARGET ORGAN DATA:BEHAVIORAL (EFTS OF OVEREXP)

Explanation of Carcinogenicity:NOT RELEVANT

Effects of Overexposure:HLTH HAZ:(CONVLS/EFT ON SEIZURE THRESHOLD; FOOD INTAKE). GI (GASTRITIS; HYPERMOTILITY, DIARR; NAUS/VOMIT). KIDNEY, URETER, BLADDER (CHANGES IN TUBULES). ENDOCRINE (TUMORS). BLOOD (OTHER HEMOLYSIS WITH OR W/OUT ANEMIA). PATERNAL EFTS (SPERMATOGENESIS; TESTES, EPIDIDYMIS, SPERM DUCT). EFTS ON FERTILITY (POST- (SUPP DATA)

Medical Cond Aggravated by Exposure:NONE SPECIFIED BY MANUFACTURER.

=====
===== First Aid Measures =====

First Aid:SKIN:IMMEDIATELY WASH W/SOAP & COPIOUS AMOUNTS OF WATER. REMOVE & WASH CONTAMINATED CLOTHING PROMPTLY. EYES:IMMEDIATELY FLUSH W/COPIOUS AMOUNTS OF WATER FOR AT LEAST 15 MINUTES. INHAL:REMOVE TO FRESH AIR. IF NOT BREATHING GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN. INGEST:WASH OUT MOUTH W/WATER PROVIDED PERSON IS CONSCIOUS. CALL MD.

=====
===== Fire Fighting Measures =====

Extinguishing Media:NONCOMBUSTIBLE. USE EXTINGUISHING MEDIA APPROPRIATE TO SURROUNDING FIRE CONDITIONS.

Fire Fighting Procedures:USE NIOSH/MSHA APPROVED SCBA & FULL PROTECTIVE EQUIPMENT .

Unusual Fire/Explosion Hazard:EMITS TOXIC FUMES UNDER FIRE CONDITIONS.

=====
===== Accidental Release Measures =====

Spill Release Procedures:WEAR NIOSH/MSHA APPROVED RESPIRATOR, CHEMICAL SAFETY GOGGLES, RUBBER BOOTS & HEAVY RUBBER GLOVES. SWEEP UP, PLACE IN A BAG & HOLD FOR WASTE DISPOSAL. AVOID RAISING DUST. VENTILATE AREA & WASH SPILL SITE AFTER MATERIAL PICKUP IS COMPLETE.

Neutralizing Agent:NONE SPECIFIED BY MANUFACTURER.

=====
===== Handling and Storage =====

Handling and Storage Precautions:DO NOT GET IN EYES, ON SKIN, ON CLOTHING. DO NOT BREATHE DUST. TOXIC. SEVERE EYE IRRITANT. POSSIBLE MUTAGEN. KEEP TIGHTLY CLOSED. PROTECT FROM AIR.

Other Precautions:HYGROSCOPIC. HANDLE & STORE UNDER NITROGEN.

=====
===== Exposure Controls/Personal Protection =====

Respiratory Protection:NIOSH/MSHA APPROVED RESPIRATOR IN NONVENTILATED AREAS &/OR FOR EXPOSURE ABOVE ACGIH TLV.

Ventilation:USE ONLY IN A CHEMICAL FUME HOOD.

Protective Gloves:LONG RUBBER/NEOPRENE GAUNTLET GLOVES.

Eye Protection:ANSI APPROVED CHEM WORKERS GOGGS .

Other Protective Equipment:SAFETY SHOWER & EYE BATH. RUBBER APRON.

Work Hygienic Practices:WASH THOROUGHLY AFTER HANDLING.

Supplemental Safety and Health

EFTS OF OVEREXP:IMPLANTATION MORTALITY; OTHER MEASURES OF FERTILITY). EFTS ON EMBRYO/FETUS (FETOTOX). SPECIFIC DEVEL ABNORMS (CNS; BODY WALL; CVS). TUMORIGENIC (EQUIVOCAL TUMORIGENIC AGENT BY RTECS CRITERIA). WASTE DISP METH:HYPOCHLORITE. NEUT SOLN BEFORE FLUSHING

DOWN DRAIN. OBSERVE ALL FED, STATE & LOC ENVIRON REGS.

===== Physical/Chemical Properties =====

Melt/Freeze Pt:M.P/F.P Text:392F,200C
Vapor Pres:7.3 @ 25C
Spec Gravity:3.603
Appearance and Odor:LIGHT-GREY POWDER.

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES
CORRODES STEEL. FINELY POWDERED METALS. ANHYDROUS COPPER (II) SULFATE
REACTS VIOLENTLY W/HYDROXYLAMINE, MAGNESIUM.
Stability Condition to Avoid:MOISTURE. SENSITIVE TO AIR.
Hazardous Decomposition Products:TOXIC FUMES OF: SULFUR OXIDES.

===== Disposal Considerations =====

Waste Disposal Methods:MATL SHOULD BE DISSOLVED IN 1)WATER; 2)ACID SOLN
OR 3)OXIDIZED TO WATER-SOL STATE. PRECIP MATL AS SULFIDE, ADJUSTING
PH OF SOLN TO 7 TO COMPLETE PRECIP. FILTER INSOLS & DISP OF THEM IN
HAZ-WASTE SITE. DESTROY ANY EXCESS SULFIDE W/SODIUM (SUPP DATA)

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document should seek competent professional advice to verify and
assume responsibility for the suitability of this information to their
particular situation.

International Chemical Safety Cards

COPPER (I) OXIDE

ICSC: 0421

<p>COPPER (I) OXIDE Dicopper oxide Cuprous oxide Red copper oxide Cu_2O Molecular mass: 143.1</p> <p>CAS # 1317-39-1 RTECS # GL8050000 ICSC # 0421 EC # 029-002-00-X</p>

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Not combustible.		In case of fire in the surroundings: all extinguishing agents allowed.
EXPLOSION			
EXPOSURE		PREVENT DISPERSION OF DUST! STRICT HYGIENE!	
• INHALATION	Cough. Sore throat. Metal fume fever. Metallic taste. See Notes.	Local exhaust or breathing protection.	Fresh air, rest.
• SKIN	Dry skin.		Remove contaminated clothes. Rinse and then wash skin with water and soap.
• EYES	Redness. Pain.	Safety goggles, or eye protection in combination with breathing protection.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
• INGESTION	Abdominal pain. Diarrhoea. Nausea. Vomiting. Metallic taste.	Do not eat, drink, or smoke during work.	Rinse mouth. Give plenty of water to drink. Refer for medical attention.
SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING	
Sweep spilled substance into containers; if appropriate, moisten first to prevent dusting. Carefully collect remainder, then remove to		Xn symbol R: 22 S: (2-)22	

safe place (extra personal protection: P2 filter respirator for harmful particles).

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0421

Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities © IPCS CEC 1993

International Chemical Safety Cards

COPPER (I) OXIDE

ICSC: 0421

I M P O R T A N T D A T A	PHYSICAL STATE; APPEARANCE: YELLOW, RED OR BROWN CRYSTALLINE POWDER.	ROUTES OF EXPOSURE: The substance can be absorbed into the body by inhalation and by ingestion.
	PHYSICAL DANGERS:	INHALATION RISK: Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly when dispersed.
	CHEMICAL DANGERS:	
	OCCUPATIONAL EXPOSURE LIMITS (OELs): TLV (as Cu, dust and mists): 1 mg/m ³ ; (as Cu, fume: 0.2 mg/m ³) (ACGIH 1996). MAK as Cu: ppm; mg/m ³ 1 (1996).	EFFECTS OF SHORT-TERM EXPOSURE: The substance irritates the eyes and the respiratory tract. Inhalation of fume may cause metal fever. The substance may cause effects on the kidneys and liver after ingestion. The effects may be delayed.
		EFFECTS OF LONG-TERM OR REPEATED EXPOSURE: Repeated or prolonged contact with skin may cause dermatitis.
PHYSICAL PROPERTIES	Decomposes below boiling point at 1800°C Melting point: 1232°C	Relative density (water = 1): 6.0 Solubility in water: none
ENVIRONMENTAL DATA		
NOTES		
Headache, cough, sweating, nausea and fever may be caused by freshly formed fumes or dust of copper oxide. The symptoms of metal fume fever do not become manifest until 4-12 hours after exposure. C.I. 77402, Copox, Copper Nordox, Copper Sardex, Perenox, Yellow Cuprocide are trade names.		
Transport Emergency Card: TEC (R)-61G11c		

ADDITIONAL INFORMATION

ICSC: 0421

COPPER (I) OXIDE

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**IMPORTANT
LEGAL
NOTICE:**

Neither the CEC or the IPCS nor any person acting on behalf of the CEC or the IPCS is responsible for the use which might be made of this information. This card contains the collective views of the IPCS Peer Review Committee and may not reflect in all cases all the detailed requirements included in national legislation on the subject. The user should verify compliance of the cards with the relevant legislation in the country of use.

ATOMERGIC CHEMETALS CORP -- COPPER SULFIDE, CHALCOCITE, CUPROUS
SULFIDE -- 6810-00N055793

=====
Product Identification
=====

Product ID:COPPER SULFIDE, CHALCOCITE, CUPROUS SULFIDE
MSDS Date:10/05/1990
FSC:6810
NIIN:00N055793
MSDS Number: BWCPM
=== Responsible Party ===
Company Name:ATOMERGIC CHEMETALS CORP
Address:222 SHERWOOD AVE
City:FARMINGDALE
State:NY
ZIP:11735-1718
Country:US
Info Phone Num:516-694-9000
Emergency Phone Num:516-694-9000
CAGE:1S133

==== Contractor Identification ====

Company Name:ATOMERGIC CHEMETALS CORP
Address:91 CAROLYN BLVD
Box:City:FARMINGDALE
State:NY
ZIP:11735-1527
Country:US
CAGE:1S133

=====
Composition/Information on Ingredients
=====

Ingred Name:COPPER SULFIDE
CAS:22205-45-4
RTECS #:GL8910000
Fraction by Wt: 100%
OSHA PEL:1 MG/M3 (AS CU)
ACGIH TLV:1 MG/M3 (AS CU)

=====
Hazards Identification
=====

LD50 LC50 Mixture:NONE SPECIFIED BY MANUFACTURER.
Routes of Entry: Inhalation:YES Skin:NO Ingestion:NO
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:INHAL:RESP IRRIT. IRRIT, SNEEZING,
COUGHING, DFCLTY BRTHG & PULM EDEMA POSS. SKIN:ITCHING, REDNESS,
INFLAMM & DERM POSS. EYE:IRRIT, WATERING, REDNESS, POSS OF BURNS &
TISS DMG. INGEST:NAUS, VOMIT, SAL IVATION, STOMACH CRAMPS, DIZZ &
DIARR POSS. MAY CAUSE LIVER, KIDNEY & NERVOUS SYS DMG WITH CHRONIC
(EFTS OF OVEREXP)
Explanation of Carcinogenicity:NOT RELEVANT
Effects of Overexposure:HLTH HAZ:EXPOS. MUTAGENIC. AS THE SUBLIMED
OXIDE, COPPER MAY BE RESPONSIBLE FOR ONE FORM OF METAL FUME FEVER.
INHAL OF COPPER DUST HAS CAUSED, IN ANIMALS, HEMOLYSIS OF RED BLOOD
CELLS, DEPOSITION OF H EMOFUSCIN IN LIVER & PANCREAS, & INJURYTO
LUNG CELLS. CUPROUS OXIDE IS IRRIT TO EYES & UPPER RESP TRACT.
(SUPP DATA)
Medical Cond Aggravated by Exposure:RESPIRATORY DISORDERS.

=====
First Aid Measures
=====

First Aid:INGEST:GIVE 2 GLASSES OF WATER AND INDUCE VOMITING.
INHAL:REMOVE TO FRESH AIR; GIVE OXYGEN IF BREATHING IS DIFFICULT.
SEEK MEDICAL ATTENTION. SKIN:BRUSH MATERIAL OFF SKIN AND WASH AREA
WITH SOAP AND WATER. SEEK MEDICAL ATTENTION. EYE:FLUSH EYES WITH
LUKEWARM WATER FOR AT LEAST 15 MINUTES AND SEEK MEDICAL ATTENTION.

=====
Fire Fighting Measures
=====

Flash Point:NON APPLICABLE
Extinguishing Media:USE DRY CHEMICAL, CO₂.
Fire Fighting Procedures:WEAR NIOSH/MSHA APPROVED SCBA & FULL
PROTECTIVE EQUIPMENT .
Unusual Fire/Explosion Hazard:MATERIAL EMITS TOXIC FUMES OF SO₂ WHEN HEATED
TO DECOMP. HYDROGEN SULFIDE EVOLVED CAN FORM EXPLOSIVE MIXTURE WITH AIR. UPON
CONTACT WITH MOISTURE/ACIDS HYDROGEN SULFIDE MAY (SUP DAT)

=====
Accidental Release Measures
=====

Spill Release Procedures:WEAR A SCBA AND FULL PROTECTIVE CLOTHING.
ISOLATE AREA WHERE THE SPILL OCCURRED AND INSURE PROPER VENTILATION
IS AVAILABLE. VACUUM UP SPILL USING A HIGH EFFICIENCY UNIT AND
PLACE IN A CONTAINER FOR PROPER DISPOSAL. TAKE CARE NOT TO RAISE
DUST.
Neutralizing Agent:NONE SPECIFIED BY MANUFACTURER.

=====
Handling and Storage
=====

Handling and Storage Precautions:STORE IN TIGHTLY CLOSED CONTAINERS IN
A COOL, DRY PLACE.
Other Precautions:NONE SPECIFIED BY MANUFACTURER.

=====
Exposure Controls/Personal Protection
=====

Respiratory Protection:WEAR NIOSH/MSHA APPROVED DUST-MIST-FUME
CARTRIDGE RESPIRATOR.
Ventilation:LOCAL EXHAUST:MAINTAIN EXPOSURE BELOW TLV.
MECHANICAL:RECOMMENDED. SPECIAL:HANDLE IN CONTROLLED ATMOSPHERE.
Protective Gloves:NEOPRENE.
Eye Protection:ANSI APPROVED CHEM WORKER GOGGLES .
Other Protective Equipment:WEAR PROTECTIVE CLOTHING TO PREVENT CONTACT OF SKIN &
CLOTHING. ANSI APPROVED EMERGENCY EYE BATH & DELUGE SHOWER .
Work Hygienic Practices:WASH HANDS AND FACE THOROUGHLY AFTER HANDLING
AND BEFORE EATING.
Supplemental Safety and Health
SOLUBLE IN WATER:1X10⁻¹⁴ G/100 ML. EXPLOSIVE HAZARD:BE AVOIDED. MANY POWERFUL
OXIDIZERS ON CONTACT WITH SULFIDES IGNITE VIOLENTLY. EFFECTS OF
OVEREXPOSURE:DISCOLORATION OF THE SKIN IS OFTEN SEEN IN PERSONS HANDLING
COPPER, BUT THIS DOES NOT INDICATE ANY ACTUAL INJURY FROM COPPER.

=====
Physical/Chemical Properties
=====

Melt/Freeze Pt:M.P/F.P Text:2012F,1100C
Evaporation Rate & Reference:N/A(H₂O=1)
Solubility in Water:INSOLUBLE (SUP DAT)

Appearance and Odor:BLUISH-BLACK CRYSTALLINE POWDER

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:NO
OXIDIZERS, ACIDS.
Stability Condition to Avoid:HEATING IN AIR.
Hazardous Decomposition Products:SO*X, CN FUMES (THERMAL), H*2S.
Conditions to Avoid Polymerization:HEAT, INCOMPATIBLE MATERIALS.

===== Disposal Considerations =====

Waste Disposal Methods:DISPOSE OF IN ACCORDANCE WITH APPLICABLE
FEDERAL, STATE AND LOCAL REGULATIONS.

Disclaimer (provided with this information by the compiling agencies):
This information is formulated for use by elements of the Department
of Defense. The United States of America in no manner whatsoever,
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document should seek competent professional advice to verify and
assume responsibility for the suitability of this information to their
particular situation.

Material Safety Data Sheet

D-Glucosamine Hydrochloride, 98%

ACC# 45769

Section 1 - Chemical Product and Company Identification

MSDS Name: D-Glucosamine Hydrochloride, 98%

Catalog Numbers: AC119900000, AC119900100, AC119900250, AC119901000, AC119905000

Synonyms:

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
66-84-2	D-Glucosamine Hydrochloride	98	200-638-1

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white crystalline powder.

Target Organs: None.

Potential Health Effects

Eye: May cause eye irritation. The toxicological properties of this material have not been fully investigated.

Skin: May cause skin irritation. The toxicological properties of this material have not been fully investigated.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. The toxicological properties of this substance have not been fully investigated.

Inhalation: May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated.

Chronic: Not available.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: ; Flammability: ; Instability:

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up or absorb material, then place into a suitable clean, dry, closed container for disposal. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use only in a well-ventilated area. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation.

Storage: Keep container closed when not in use. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
D-Glucosamine Hydrochloride	none listed	none listed	none listed

OSHA Vacated PELs: D-Glucosamine Hydrochloride: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Powder

Appearance: white

Odor: None reported.

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 190.00 - 194.00 deg C

Decomposition Temperature: Not available.

Solubility: soluble

Specific Gravity/Density: Not available.

Molecular Formula: C₆H₁₃NO₅.HCl

Molecular Weight: 215.64

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, strong oxidants.

Incompatibilities with Other Materials: Strong oxidizing agents.

Hazardous Decomposition Products: Hydrogen chloride, nitrogen oxides, carbon monoxide, carbon dioxide, nitrogen gas.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 66-84-2: LZ6665000

LD50/LC50:

CAS# 66-84-2:

Oral, mouse: LD50 = 15 gm/kg;

Carcinogenicity:

CAS# 66-84-2: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No data available.

Teratogenicity: No data available.

Reproductive Effects: No data available.

Mutagenicity: No data available.

Neurotoxicity: No data available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.
RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 66-84-2 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 66-84-2 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations
European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 66-84-2: No information available.

Canada - DSL/NDSL

CAS# 66-84-2 is listed on Canada's DSL List.

Canada - WHMIS

WHMIS: Not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

alpha-D-(+)-Lactose monohydrate

ACC# 45372

Section 1 - Chemical Product and Company Identification

MSDS Name: alpha-D-(+)-Lactose monohydrate

Catalog Numbers: S71955, S71956, L5-500, L6-200LB, L6-212, L6-500, L8-12, L8-212

Synonyms: Milk Sugar; Lactin; Lactobiose; 4-(beta-d-Galactosido)-d-Glucose; Soccharum Lactin

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
5989-81-1	alpha-D-Lactose monohydrate	100	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid.

Caution! May cause eye and skin irritation. The toxicological properties of this material have not been fully investigated.

Target Organs: None known.

Potential Health Effects

Eye: May cause eye irritation. The toxicological properties of this material have not been fully investigated.

Skin: May cause skin irritation. The toxicological properties of this material have not been fully investigated.

Ingestion: Ingestion of large amounts may cause gastrointestinal irritation. The

toxicological properties of this substance have not been fully investigated.

Inhalation: May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water. Get medical aid if irritation or symptoms occur.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Dust can be an explosion hazard when exposed to heat or flame.

Extinguishing Media: Use agent most appropriate to extinguish fire. Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 1; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
alpha-D-Lactose monohydrate	none listed	none listed	none listed

OSHA Vacated PELs: alpha-D-Lactose monohydrate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white

Odor: odorless

pH: Not available.

Vapor Pressure: Negligible.

Vapor Density: Not available.

Evaporation Rate: Negligible.

Viscosity: Not available.

Boiling Point: Decomposes
Freezing/Melting Point: 219 deg C
Decomposition Temperature: > 219 deg C
Solubility: Soluble in water.
Specific Gravity/Density: 1.525
Molecular Formula: C₁₂H₂₂O₁₁.H₂O
Molecular Weight: 360.32

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Incompatible materials, dust generation, excess heat.
Incompatibilities with Other Materials: Oxidizing agents.
Hazardous Decomposition Products: Carbon monoxide, irritating and toxic fumes and gases, carbon dioxide.
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:
CAS# 5989-81-1 unlisted.
LD50/LC50:
Not available.

Carcinogenicity:
CAS# 5989-81-1: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.
Teratogenicity: No information available.
Reproductive Effects: No information available.
Mutagenicity: No information available.
Neurotoxicity: No information available.
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 5989-81-1 is not on the TSCA Inventory because it is a hydrate. It is considered to be listed if the CAS number for the anhydrous form is on the inventory (40CFR720.3(u)(2)).

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 5989-81-1 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 5989-81-1: No information available.

Canada - DSL/NDSL

None of the chemicals in this product are listed on the DSL or NDSL list.

Canada - WHMIS

This product has a WHMIS classification of Not controlled..

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Decanoic acid

ACC# 66455

Section 1 - Chemical Product and Company Identification

MSDS Name: Decanoic acid

Catalog Numbers: AC111900000, AC111900010, AC111901000, AC167270000, AC167271000, AC167275000, S76767

Synonyms: Capric acid.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
334-48-5	Decanoic acid	96+	206-376-4

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white to light yellow solid.

Warning! Causes eye, skin, and respiratory tract irritation.

Target Organs: Blood, respiratory system, eyes, skin.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Causes skin irritation. May be harmful if absorbed through the skin.

Ingestion: May cause irritation of the digestive tract. May be harmful if swallowed.

Inhalation: Causes respiratory tract irritation. May be harmful if inhaled.

Chronic: Chronic exposure may cause blood effects.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: Do not induce vomiting. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: 113 deg C (235.40 deg F)

Autoignition Temperature: Not available.

Explosion Limits, Lower:Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 1; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation. Do not let this chemical enter the environment.

Section 7 - Handling and Storage

Handling: Minimize dust generation and accumulation. Do not get in eyes, on skin, or on clothing. Do not ingest or inhale. Use with adequate ventilation.

Storage: Store in a cool, dry place. Store in a tightly closed container.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Decanoic acid	none listed	none listed	none listed

OSHA Vacated PELs: Decanoic acid: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white to light yellow

Odor: none reported

pH: 4.6 (0.01 g/L aq.sol.)

Vapor Pressure: 0.13 hPa @ 79 deg C

Vapor Density: Not available.

Evaporation Rate:Not available.

Viscosity: Not available.

Boiling Point: 268 - 270 deg C @ 760 mmHg

Freezing/Melting Point:30 - 32 deg C

Decomposition Temperature:Not available.

Solubility: 0.15 g/L (20°C)

Specific Gravity/Density:0.890

Molecular Formula:C10H20O2

Molecular Weight:172.27

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, dust generation, excess heat.

Incompatibilities with Other Materials: Strong oxidizing agents, reducing agents, bases.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide.

Hazardous Polymerization: Has not been reported

Section 11 - Toxicological Information

RTECS#:

CAS# 334-48-5: HD9100000

LD50/LC50:

CAS# 334-48-5:

Draize test, rabbit, skin: 500 mg/24H Moderate;

Oral, rat: LD50 = >10 gm/kg;

Carcinogenicity:

CAS# 334-48-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: See actual entry in RTECS for complete information.

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: Fish: Killifish: LC50 = 20 mg/L; 96 Hr.; Unspecified No data available.

Environmental: No information available.

Physical: No information available.

Other: Do not empty into drains.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.
RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated.	Not regulated.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 334-48-5 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 334-48-5: immediate.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 334-48-5 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XI

Risk Phrases:

R 36/37/38 Irritating to eyes, respiratory system and skin.

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 37/39 Wear suitable gloves and eye/face protection.

WGK (Water Danger/Protection)

CAS# 334-48-5: 1

Canada - DSL/NDSL

CAS# 334-48-5 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 334-48-5 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Carbon, decolorizing NORIT A (now sold as NORIT SA-3)

ACC# 95961

Section 1 - Chemical Product and Company Identification

MSDS Name: Carbon, decolorizing NORIT A (now sold as NORIT SA-3)

Catalog Numbers: AC404030000, AC404030030, AC404035000

Synonyms: Synthetic graphite; Acetylene black; Black pearls; Carbon, activated.

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7440-44-0	Carbon	100	231-153-3

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: black solid.

Caution! May cause eye irritation. May cause lung damage.

Target Organs: Lungs.

Potential Health Effects

Eye: Causes eye irritation. May cause conjunctivitis.

Skin: May cause skin irritation.

Ingestion: Ingestion of large amounts may cause gastrointestinal irritation.

Inhalation: Dust is irritating to the respiratory tract. May cause lung damage.

Chronic: Chronic inhalation may lead to decreased pulmonary function.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists. Wash clothing before reuse.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Use water spray to keep fire-exposed containers cool. Dust can be an explosion hazard when exposed to heat or flame. Can be easily ignited and burns vigorously. Containers may explode if exposed to fire.

Extinguishing Media: For large fires, use water spray, fog or alcohol-resistant foam. For small fires, use dry chemical, carbon dioxide, sand, earth, water spray or regular foam. Cool containers with flooding quantities of water until well after fire is out.

Flash Point: Not applicable.

Autoignition Temperature: 230 deg C (446.00 deg F)

Explosion Limits, Lower:N/A

Upper: N/A

NFPA Rating: (estimated) Health: 1; Flammability: 1; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation.

Storage: Store in a cool, dry place. Store in a tightly closed container. Keep from contact with oxidizing materials.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate ventilation to keep airborne concentrations low.
Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Carbon	none listed	none listed	none listed

OSHA Vacated PELs: Carbon: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: black

Odor: Odorless.

pH: Not available.

Vapor Pressure: 1 mm Hg @ 3586C

Vapor Density: Not available.

Evaporation Rate: Negligible.

Viscosity: Not available.

Boiling Point: Sublimes @ 3652 deg C

Freezing/Melting Point: 3652 deg C

Decomposition Temperature: Not available.

Solubility: Insoluble.

Specific Gravity/Density: 1.8-2.1

Molecular Formula: C

Molecular Weight: 12

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Dust generation, moisture, excess heat.

Incompatibilities with Other Materials: May react vigorously or violently when mixed with strong oxidizing agents such as chlorates, bromates and nitrates, especially when heated. Incompatible with chlorinated paraffins, Lead oxide, manganese oxide, iron oxide, liquid oxygen, oils, and moisture.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 7440-44-0: FF5250100

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 7440-44-0: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: No information available.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: Particulates settle out of atmosphere and water.

Physical: No information available.

Other: No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7440-44-0 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 7440-44-0: immediate.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7440-44-0 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 7440-44-0: 0

Canada - DSL/NDSL

CAS# 7440-44-0 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Deoxyribonucleic Acid

ACC# 08465

Section 1 - Chemical Product and Company Identification

MSDS Name: Deoxyribonucleic Acid

Catalog Numbers: S79993

Synonyms: DNA; Calf thymus DNA

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
9007-49-2	Deoxyribonucleic Acid	100.0	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white to tan solid.

Caution! May cause respiratory tract irritation. May cause skin irritation. May cause eye irritation.

Target Organs: None.

Potential Health Effects

Eye: Dust may cause mechanical irritation.

Skin: May cause skin irritation.

Ingestion: Causes gastrointestinal irritation with nausea, vomiting and diarrhea.

Inhalation: May cause respiratory tract irritation.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. If irritation develops, get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media: For small fires, use water spray, dry chemical, carbon dioxide or chemical foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: ; Flammability: ; Instability:

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Sweep up, then place into a suitable container for disposal. Avoid generating dusty conditions.

Section 7 - Handling and Storage

Handling: Use with adequate ventilation. Avoid contact with skin and eyes. Avoid ingestion and inhalation.

Storage: Keep away from heat and flame. Store in a cool, dry place. Keep from contact with oxidizing materials.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate ventilation to keep airborne concentrations low.
Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Deoxyribonucleic Acid	none listed	none listed	none listed

OSHA Vacated PELs: Deoxyribonucleic Acid: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white to tan

Odor: none reported

pH: Not available.

Vapor Pressure: Negligible.

Vapor Density: Not available.

Evaporation Rate:Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point:Not available.

Decomposition Temperature:Not available.

Solubility: Slightly soluble in water.

Specific Gravity/Density:Not available.

Molecular Formula:Not applicable.

Molecular Weight:Not available.

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials.

Incompatibilities with Other Materials: Strong oxidizing agents.

Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, carbon dioxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 9007-49-2: HG1933000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 9007-49-2: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: No information available.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 9007-49-2 is not listed on the TSCA inventory. It is for research and development use only.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 9007-49-2 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XN

Risk Phrases:

R 22 Harmful if swallowed.

Safety Phrases:

WGK (Water Danger/Protection)

CAS# 9007-49-2: No information available.

Canada - DSL/NDSL

CAS# 9007-49-2 is listed on Canada's DSL List.

Canada - WHMIS

WHMIS: Not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Dextrin

ACC# 90255

Section 1 - Chemical Product and Company Identification

MSDS Name: Dextrin

Catalog Numbers: S76768

Synonyms: Artificial gum; Starch gum; Tapioca; Vegetable gum.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
9004-53-9	Dextrin	100	232-675-4

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white to off-white.

Caution! May cause eye, skin, and respiratory tract irritation. Hygroscopic (absorbs moisture from the air). This is expected to be a low hazard for usual industrial handling.

Target Organs: None.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation.

Ingestion: Ingestion of large amounts may cause gastrointestinal irritation.

Inhalation: May cause respiratory tract irritation.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid if irritation develops or persists. Wash clothing before reuse. Flush skin with plenty of soap and water.

Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid if irritation or symptoms occur.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use extinguishing media most appropriate for the surrounding fire.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 0; Flammability: 1; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Wash thoroughly after handling. Minimize dust

generation and accumulation. Avoid contact with skin and eyes. Avoid ingestion and inhalation.

Storage: Store in a cool, dry place. Keep container closed when not in use. Store protected from moisture.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Good general ventilation should be sufficient to control airborne levels.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Dextrin	none listed	none listed	none listed

OSHA Vacated PELs: Dextrin: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Protective garments not normally required.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white to off-white

Odor: None reported.

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: 5.6

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: Not available.

Decomposition Temperature: Not available.

Solubility: Soluble in hot water.

Specific Gravity/Density: Not available.

Molecular Formula: C₆H₁₀O₅

Molecular Weight: 162.067

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Exposure to moist air or water.

Incompatibilities with Other Materials: Strong oxidizers.

Hazardous Decomposition Products: Carbon monoxide, irritating and toxic fumes and gases, carbon dioxide.

Hazardous Polymerization: Has not been reported

Section 11 - Toxicological Information

RTECS#:

CAS# 9004-53-9: HH9450000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 9004-53-9: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: No information available.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 9004-53-9 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313

No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 9004-53-9 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 9004-53-9: 0

Canada - DSL/NDSL

CAS# 9004-53-9 is listed on Canada's DSL List.

Canada - WHMIS

WHMIS: Not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

D-Fructose

ACC# 06165

Section 1 - Chemical Product and Company Identification

MSDS Name: D-Fructose

Catalog Numbers: AC161350010, AC161350025, AC161355000, AC219570010, AC219572500, S72221C, S76787, S80020, S93276, L95-500, L96-12, L96-212, L96-500, L96100LB

Synonyms: Fruit sugar; D(-)-Fructose; Levulose; Fructose.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
57-48-7	D-Fructose	>98	200-333-3

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white crystalline powder.

Caution! May cause eye irritation. This is expected to be a low hazard for usual industrial handling.

Target Organs: None.

Potential Health Effects

Eye: May cause eye irritation.

Skin: Low hazard for usual industrial handling.

Ingestion: Low hazard for usual industrial handling.

Inhalation: Dust is irritating to the respiratory tract. Low hazard for usual industrial

handling.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. If irritation develops, get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid if irritation or symptoms occur.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Dust from this material can form explosive organic dust cloud.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 0; Flammability: 1; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container.

Clean up spills immediately, observing precautions in the Protective Equipment section.

Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid breathing dust.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
D-Fructose	none listed	none listed	none listed

OSHA Vacated PELs: D-Fructose: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Protective garments not normally required.

Clothing: Protective garments not normally required.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Crystalline powder

Appearance: white

Odor: Not available.

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate:Not applicable.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point:103-105 deg C (dec)

Decomposition Temperature:103-105 deg C

Solubility: Freely Soluble.

Specific Gravity/Density:Not available.

Molecular Formula:C6H12O6

Molecular Weight:180.16

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions.

Conditions to Avoid: Dust generation, moisture, excess heat.

Incompatibilities with Other Materials: Strong oxidizing agents.

Hazardous Decomposition Products: Carbon monoxide, irritating and toxic fumes and gases, carbon dioxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 57-48-7: LS7120000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 57-48-7: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: No information available.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR

Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not Regulated	Not Regulated
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 57-48-7 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 57-48-7 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 57-48-7: 0

Canada - DSL/NDSL

CAS# 57-48-7 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of Not controlled.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

D-Galactose, 98% (HPLC)

ACC# 00654

Section 1 - Chemical Product and Company Identification

MSDS Name: D-Galactose, 98% (HPLC)

Catalog Numbers: AC410840000, AC410841000, AC410845000

Synonyms: D-Galactopyranose

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
59-23-4	D-Galactose	ca. 100%	200-416-4

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white.

Caution! May cause eye and skin irritation. May cause respiratory and digestive tract irritation. This substance has caused adverse reproductive and fetal effects in animals. This is expected to be a low hazard for usual industrial handling.

Target Organs: None.

Potential Health Effects

Eye: May cause eye irritation. Dust may cause mechanical irritation.

Skin: May cause skin irritation. Low hazard for usual industrial handling.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. Low hazard for usual industrial handling.

Inhalation: May cause respiratory tract irritation. Low hazard for usual industrial handling.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. If irritation develops, get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists. Wash clothing before reuse.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Dusts at sufficient concentrations can form explosive mixtures with air. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Vapors may be heavier than air. They can spread along the ground and collect in low or confined areas.

Extinguishing Media: Use agent most appropriate to extinguish fire. Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Store in a tightly closed container. Keep from contact with oxidizing materials. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate ventilation to keep airborne concentrations low.
Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
D-Galactose	none listed	none listed	none listed

OSHA Vacated PELs: D-Galactose: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white

Odor: odorless

pH: Not available.

Vapor Pressure: Negligible.

Vapor Density: 6.2

Evaporation Rate: Negligible.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 167 deg C

Decomposition Temperature: Not available.

Solubility: 680 g/l (25 C) in water.

Specific Gravity/Density: Not available.

Molecular Formula:C6H12O6

Molecular Weight:180.0804

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, dust generation, excess heat.

Incompatibilities with Other Materials: Oxidizing agents.

Hazardous Decomposition Products: Carbon monoxide, carbon monoxide, carbon dioxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 59-23-4: LW5490000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 59-23-4: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: Effects on Newborn: Germ cell effects, oral-rat TDLo=1000g/kg; Growth Statistics, oral-rat TDLo=440g/kg; Live birth index, oral-mouse TDLo=165g/kg. Embryo or fetus, oral-rat TDLo=240g/kg.

Reproductive Effects: Fertility: Abortion, oral-mouse TDLo=1260g/kg.

Mutagenicity: No information available.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a

hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 59-23-4 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 59-23-4 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

Not available.

Risk Phrases:**Safety Phrases:**

S 24/25 Avoid contact with skin and eyes.

S 37 Wear suitable gloves.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 28A After contact with skin, wash immediately with plenty of water

WGK (Water Danger/Protection)

CAS# 59-23-4: 0

Canada - DSL/NDSL

CAS# 59-23-4 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2A.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

3,3'-Diazido-Diphenylsulfone, 97%

ACC# 36679

Section 1 - Chemical Product and Company Identification

MSDS Name: 3,3'-Diazido-Diphenylsulfone, 97%

Catalog Numbers: AC294730000, AC294730050

Synonyms: None Known.

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
75742-13-1	3,3'-Diazido-Diphenylsulfone	97%	278-300-8

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: yellow solid.

Warning! Causes eye and respiratory tract irritation. May cause skin irritation. Light sensitive. The toxicological properties of this material have not been fully investigated.

Target Organs: None known.

Potential Health Effects

Eye: Causes eye irritation.

Skin: May cause skin irritation.

Ingestion: May cause irritation of the digestive tract. The toxicological properties of this substance have not been fully investigated.

Inhalation: Causes respiratory tract irritation. The toxicological properties of this substance have not been fully investigated.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Runoff from fire control or dilution water may cause pollution.

Extinguishing Media: In case of fire, use water, dry chemical, chemical foam, or alcohol-resistant foam. Use agent most appropriate to extinguish fire.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before

reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation. Store protected from light.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep refrigerated. (Store below 4°C/39°F.) Store protected from light.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
3,3'-Diazido-Diphenylsulfone	none listed	none listed	none listed

OSHA Vacated PELs: 3,3'-Diazido-Diphenylsulfone: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: yellow

Odor: None reported.

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 108.00 - 110.00 deg C

Decomposition Temperature: Not available.

Solubility: insoluble

Specific Gravity/Density: Not available.

Molecular Formula: C₁₂H₈N₆O₂S

Molecular Weight: 300.29

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, light, excess heat, strong oxidants.

Incompatibilities with Other Materials: Oxidizing agents.

Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, carbon monoxide, carbon dioxide, nitrogen gas, sulfur oxides (SO_x), including sulfur oxide and sulfur dioxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 75742-13-1 unlisted.

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 75742-13-1: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 75742-13-1 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.
None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 75742-13-1 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XN

Risk Phrases:

R 20/22 Harmful by inhalation and if swallowed.
R 36/37 Irritating to eyes and respiratory system.

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S 37 Wear suitable gloves.
S 39 Wear eye/face protection.
S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
S 28A After contact with skin, wash immediately with plenty of water

WGK (Water Danger/Protection)

CAS# 75742-13-1: No information available.

Canada - DSL/NDSL

CAS# 75742-13-1 is listed on Canada's NDSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

International Chemical Safety Cards

DIMETHYLAMINE

ICSC: 0260

<p>DIMETHYLAMINE N-Methyl methanamine (cylinder) (CH₃)₂NH Molecular mass: 45.1</p> <p>CAS # 124-40-3 RTECS # IP8750000 ICSC # 0260 UN # 1032 (anhydrous) EC # 612-001-00-9</p>
--

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Extremely flammable. Gives off irritating or toxic fumes (or gases) in a fire.	NO open flames, NO sparks, and NO smoking.	Shut off supply; if not possible and no risk to surroundings, let the fire burn itself out; in other cases extinguish with powder, carbon dioxide.
EXPLOSION	Gas/air mixtures are explosive.	Closed system, ventilation, explosion-proof electrical equipment and lighting. Do NOT use compressed air for filling, discharging, or handling. Use reduced-sparking handtools.	In case of fire: keep cylinder cool by spraying with water.
EXPOSURE		STRICT HYGIENE!	
• INHALATION	Abdominal pain. Burning sensation. Cough. Diarrhoea. Laboured breathing. Shortness of breath. Sore throat.	Ventilation, local exhaust, or breathing protection.	Fresh air, rest. Half-upright position. Artificial respiration if indicated. Refer for medical attention.
• SKIN	Redness. Skin burns. Pain.	Cold-insulating gloves. Protective clothing.	Remove contaminated clothes. Rinse skin with plenty of water or shower. Refer for medical attention.
• EYES	Redness. Pain. Blurred vision. Severe deep burns.	Face shield or eye protection in combination with breathing protection.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
• INGESTION			Rinse mouth. Do NOT induce vomiting. Give plenty of water to drink. Refer for medical

		attention.
SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Evacuate danger area! Consult an expert! Ventilation. Do NOT wash away into sewer. Remove with fine water spray (extra personal protection: complete protective clothing including self-contained breathing apparatus).	Fireproof. Separated from incompatible materials (see Chemical Dangers). Cool.	F symbol Xi symbol R: 13-36/37 S: 16-26-29 UN Haz Class: 2.1
SEE IMPORTANT INFORMATION ON BACK		
ICSC: 0260	Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities © IPCS CEC 1993	

International Chemical Safety Cards

DIMETHYLAMINE

ICSC: 0260

I M P O R T A N T D A T A	<p>PHYSICAL STATE; APPEARANCE: COLOURLESS COMPRESSED LIQUEFIED GAS, WITH CHARACTERISTIC ODOUR.</p> <p>PHYSICAL DANGERS: The gas is heavier than air and may travel along the ground; distant ignition possible.</p> <p>CHEMICAL DANGERS: The substance decomposes on burning producing toxic fumes (nitrogen oxides). The substance is a medium strong base. Reacts violently with strong oxidants, such as chlorine. Reacts violently with mercury causing fire and explosion hazard. Attacks plastics, rubber, and coatings.</p> <p>OCCUPATIONAL EXPOSURE LIMITS (OELs): TLV (as TWA): 10 ppm; 18 mg/m³ (ACGIH 1992-1993). MAK: 10 ppm; 18 mg/m³; (1992).</p>	<p>ROUTES OF EXPOSURE: The substance can be absorbed into the body by inhalation and through the skin.</p> <p>INHALATION RISK: A harmful concentration of this gas in the air will be reached very quickly on loss of containment.</p> <p>EFFECTS OF SHORT-TERM EXPOSURE: The vapour is corrosive to the eyes, the skin and the respiratory tract. Inhalation of the substance may cause lung oedema (see Notes). Rapid evaporation of the liquid may cause frostbite.</p> <p>EFFECTS OF LONG-TERM OR REPEATED EXPOSURE: Repeated or prolonged contact with skin may cause dermatitis.</p>
	PHYSICAL PROPERTIES	<p>Boiling point: 7°C Melting point: -92°C Solubility in water, g/100 ml at 20°C: 23.7 Vapour pressure, kPa at 20°C: 206 Relative vapour density (air = 1): 1.56</p> <p>Flash point: Flammable Gas Auto-ignition temperature: 402°C Explosive limits, vol% in air: 2.8-14.4 Octanol/water partition coefficient as log Pow: -0.38</p>

**ENVIRONMENTAL
DATA**

This substance may be hazardous to the environment; special attention should be given to water organisms.

NOTES

The symptoms of lung oedema often do not become manifest until a few hours have passed and they are aggravated by physical effort. Rest and medical observation are therefore essential. Immediate administration of an appropriate spray, by a doctor or a person authorized by him/her, should be considered. The odour warning when the exposure limit value is exceeded is insufficient. Turn leaking cylinder with the leak up to prevent escape of gas in liquid state.

Transport Emergency Card: TEC (R)-30G33
NFPA Code: H 3; F 4; R 0;

ADDITIONAL INFORMATION**ICSC: 0260****DIMETHYLAMINE**

© IPCS, CEC, 1993

**IMPORTANT
LEGAL
NOTICE:**

Neither the CEC or the IPCS nor any person acting on behalf of the CEC or the IPCS is responsible for the use which might be made of this information. This card contains the collective views of the IPCS Peer Review Committee and may not reflect in all cases all the detailed requirements included in national legislation on the subject. The user should verify compliance of the cards with the relevant legislation in the country of use.

TIMMONS & CHARLES, INC. -- TETRASODIUM ETHYLENEDIAMINETETRAACETATE
-- 6810-01-109-3911

=====
Product Identification
=====

Product ID:TETRASODIUM ETHYLENEDIAMINETETRAACETATE

MSDS Date:01/01/1987

FSC:6810

NIIN:01-109-3911

MSDS Number: BGMFV

=== Responsible Party ===

Company Name:TIMMONS & CHARLES, INC.

Emergency Phone Num:201-862-9100

CAGE:LO772

=== Contractor Identification ===

Company Name:TIMMONS & CHARLES, INC.

CAGE:LO772

Company Name:TIMMONS AND CHARLES INC

Address:991 E LINDEN AVE

Box:1175

City:LINDEN

State:NJ

ZIP:07036-2416

Country:US

Phone:908-862-9100/FAX908-862-1680

CAGE:5G937

=====
Composition/Information on Ingredients
=====

Ingred Name:TETRASODIUM ETHYLENEDIAMINETETRAACETATE, CAS 64-02-8

CAS:64-02-8

RTECS #:AH5075000

Fraction by Wt: 84%.

Ingred Name:NITRILOTRIACETIC ACID (SARA III)

CAS:139-13-9

RTECS #:AJ0175000

Fraction by Wt: <0.2%

Ingred Name:WATER, CAS 7732-18-5 (ACTUAL WT%=<15.8)

CAS:7732-18-5

RTECS #:ZC0110000

Fraction by Wt: 15.8%

=====
Hazards Identification
=====

Effects of Overexposure:EYE,SKN:IRRT.INHL:NONE. INGEST:MAY INCREAS
ABSORPTION OF OTHERTOXICS FROM GI TRACT,IRRT,HYPOCALCEMIA

=====
First Aid Measures
=====

First Aid:EYE:FLUSH 15 MIN W/AMPLE WATER.SKN:WASH SOAP &
WATER.INHL:REMOVE TO FRESH AIR. GIVE ART RESP,O*2 AS REQD.
INGEST:IF CONSC, GIVE AMPLE WATER OR MILK. CALL PHYSICIAN IF
SYMPTOMS PERSISTS.

=====
Fire Fighting Measures
=====

Autoignition Temp:Autoignition Temp Text:NONE
Extinguishing Media:NONE
Fire Fighting Procedures:NONE
Unusual Fire/Explosion Hazard:NONE

===== Accidental Release Measures =====

Spill Release Procedures:SWEEP UP OR VACUUM POWDER INTO CLOSED
CONTAINER. DILUTE SMALL AMOUNTS WITH WATER & FLUSH TO SEWER

===== Handling and Storage =====

Handling and Storage Precautions:KEEP CONTAINERS CLOSED. STORE IN COOL
DRY LOCATION.
Other Precautions:AVOID PROLONGED CONTACT WITH MATERIAL. DO NOT INHALE
DUST.

===== Exposure Controls/Personal Protection =====

Respiratory Protection:USE DUST MASK AS REQD
Ventilation:LOCAL, GENERAL MECHANICAL
Protective Gloves:NEOPRENE
Eye Protection:GOGGLES
Other Protective Equipment:AVOID SKN/EYE CONTACT.
Supplemental Safety and Health
MSDS DTD 25JUN86.

===== Physical/Chemical Properties =====

HCC:N1
Evaporation Rate & Reference:0
Solubility in Water:COMPLETE
Appearance and Odor:ODORLESS WHITE CRYSTALS. PH1% SOLN =10.5-11.5
Percent Volatiles by Volume:15.8

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES
NONE
Stability Condition to Avoid:KEEP DRY
Hazardous Decomposition Products:CARBON, NITROGEN, SULFUR OXIDES.

===== Disposal Considerations =====

Waste Disposal Methods:LANDFILL OR INCINERATE IAW ALL LAWS & REGS.

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assume responsibility for the suitability of this information to their
particular situation.

Material Safety Data Sheet

DL-Aspartic Acid

ACC# 62635

Section 1 - Chemical Product and Company Identification

MSDS Name: DL-Aspartic Acid

Catalog Numbers: S71819

Synonyms: DI-Aminosuccinic Acid; Asparacemic Acid.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
617-45-8	dl-Aspartic Acid	app.99	210-513-3

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: colorless to white solid.

Caution! May cause eye and skin irritation. May cause respiratory and digestive tract irritation. The toxicological properties of this material have not been fully investigated.

Target Organs: No data found.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation.

Ingestion: May cause irritation of the digestive tract. The toxicological properties of this substance have not been fully investigated.

Inhalation: May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Dusts at sufficient concentrations can form explosive mixtures with air. Combustion generates toxic fumes. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use agent most appropriate to extinguish fire. Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Minimize dust generation and accumulation. May form flammable dust-air mixtures. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
dl-Aspartic Acid	none listed	none listed	none listed

OSHA Vacated PELs: dl-Aspartic Acid: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: colorless to white

Odor: none reported

pH: Not available.

Vapor Pressure: Negligible.

Vapor Density: 4.6

Evaporation Rate: Not applicable.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 277.8 deg C

Decomposition Temperature: 277.8 deg C

Solubility: Soluble in water.

Specific Gravity/Density: 1.66 (water=1)

Molecular Formula: C₄H₇NO₄

Molecular Weight: 133.0533

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: High temperatures, incompatible materials, dust generation, excess heat.

Incompatibilities with Other Materials: Oxidizing agents.

Hazardous Decomposition Products: Carbon monoxide, oxides of nitrogen, irritating and toxic fumes and gases, carbon dioxide.

Hazardous Polymerization: Has not been reported

Section 11 - Toxicological Information

RTECS#:

CAS# 617-45-8: CI9097800

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 617-45-8: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a

hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 617-45-8 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 617-45-8 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

Not available.

Risk Phrases:**Safety Phrases:**

S 37 Wear suitable gloves.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 28A After contact with skin, wash immediately with plenty of water

WGK (Water Danger/Protection)

CAS# 617-45-8: 0

Canada - DSL/NDSL

CAS# 617-45-8 is listed on Canada's DSL List.

Canada - WHMIS

not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

DL-Leucine

ACC# 96707

Section 1 - Chemical Product and Company Identification

MSDS Name: DL-Leucine

Catalog Numbers: AC172130000, AC172130250, AC172132500, AC413110000, AC413110250, AC413111000 AC413111000, ACE1135193

Synonyms: DL-Leu; DL-2-Amino-4-methylpentanoic acid.

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
328-39-2	DL-Leucine	99+	206-328-2

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: fine crystalline powder.

Caution! May cause eye, skin, and respiratory tract irritation. The toxicological properties of this material have not been fully investigated.

Target Organs: None known.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation. May be harmful if absorbed through the skin.

Ingestion: May cause irritation of the digestive tract. May be harmful if swallowed.

Inhalation: May cause respiratory tract irritation. May be harmful if inhaled.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. If irritation develops, get medical aid.

Skin: Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: Do not induce vomiting. Get medical aid if irritation or symptoms occur.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or chemical foam.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 1; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation. Do not let this chemical enter the environment.

Section 7 - Handling and Storage

Handling: Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation.

Storage: Store in a cool, dry place. Store in a tightly closed container.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
DL-Leucine	none listed	none listed	none listed

OSHA Vacated PELs: DL-Leucine: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Crystalline powder

Appearance: white - fine

Odor: None reported.

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 293 - 296 deg C(subl)

Decomposition Temperature: Not available.

Solubility: soluble

Specific Gravity/Density: Not available.

Molecular Formula: C₆H₁₃NO₂

Molecular Weight: 131.17

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, dust generation, excess heat.

Incompatibilities with Other Materials: Strong oxidizing agents.

Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, carbon dioxide.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 328-39-2 unlisted.

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 328-39-2: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information available.

Physical: No information available.

Other: Do not empty into drains.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated.	Not regulated.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 328-39-2 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313

No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 328-39-2 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 328-39-2: No information available.

Canada - DSL/NDSL

CAS# 328-39-2 is listed on Canada's DSL List.

Canada - WHMIS

not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

DL-phenylalanine-d11

ACC# 24770

Section 1 - Chemical Product and Company Identification

MSDS Name: DL-phenylalanine-d11

Catalog Numbers: AC233380000, AC233381000

Synonyms:

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
Not available	DL-Phenylalanine-d11		unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: Not available.

Caution! May cause eye and skin irritation. May cause respiratory and digestive tract irritation. Hygroscopic (absorbs moisture from the air). The toxicological properties of this material have not been fully investigated.

Target Organs: None.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation.

Ingestion: May cause irritation of the digestive tract. The toxicological properties of this substance have not been fully investigated. May be harmful if swallowed.

Inhalation: May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: N/A

Upper: N/A

NFPA Rating: (estimated) Health: 1; Flammability: ; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container.

Clean up spills immediately, observing precautions in the Protective Equipment section.

Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
DL-Phenylalanine-d11	none listed	none listed	none listed

OSHA Vacated PELs: DL-Phenylalanine-d11: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: Not available.

Odor: Not available.

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: Not available.

Decomposition Temperature: Not available.

Solubility: Not available.

Specific Gravity/Density: Not available.

Molecular Formula: C₉D₁₁NO₂

Molecular Weight: 176.28

Section 10 - Stability and Reactivity

Chemical Stability: Stability unknown.

Conditions to Avoid: Incompatible materials, dust generation, exposure to moist air or water.

Incompatibilities with Other Materials: Oxidizing agents.

Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, carbon monoxide, carbon dioxide.

Hazardous Polymerization: Has not been reported

Section 11 - Toxicological Information

RTECS#:

No CAS#s in product.

LD50/LC50:

No information

Carcinogenicity:

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: No information available.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information found.

Physical: No information found.

Other: No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

DL-Phenylalanine-d11 is not listed on the TSCA inventory. It is for research and development use only.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

S 37 Wear suitable gloves.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 28A After contact with skin, wash immediately with plenty of water

WGK (Water Danger/Protection)

Canada - DSL/NDSL

None of the chemicals in this product are listed on the DSL or NDSL list.

Canada - WHMIS

WHMIS: Not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

DL-Alanine, 99%

ACC# 51357

Section 1 - Chemical Product and Company Identification

MSDS Name: DL-Alanine, 99%

Catalog Numbers: AC159090000, AC159091000, AC159095000

Synonyms: (+-)-2-Aminopropionic acid; (R,S)-Alanine; dl-2-Aminopropionic acid; DL-alpha-Alanine. L-Alanine is non-essential amino acid for human development.

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
302-72-7	DL-Alanine	99	206-126-4

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white crystalline powder.

Caution! May cause eye, skin, and respiratory tract irritation. This is expected to be a low hazard for usual industrial handling.

Target Organs: None.

Potential Health Effects

Eye: May cause eye irritation. Dust may cause mechanical irritation.

Skin: May cause skin irritation.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea.

Inhalation: Inhalation of dust may cause respiratory tract irritation.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Gently lift eyelids and flush continuously with water. If irritation develops, get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. This material in sufficient quantity and reduced particle size is capable of creating a dust explosion.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 0; Flammability: 1; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation.

Storage: Keep container closed when not in use. Store in a cool, dry, well-ventilated area away from incompatible substances. Dark room.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Good general ventilation should be sufficient to control airborne levels.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
DL-Alanine	none listed	none listed	none listed

OSHA Vacated PELs: DL-Alanine: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Crystalline powder

Appearance: white

Odor: odorless

pH: 5.5-7 (2.5% soln)

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: Sublimes above 200 deg C

Decomposition Temperature: 264-296 deg C

Solubility: 167 g/l @ 25°C

Specific Gravity/Density: 1.424

Molecular Formula: C₃H₇NO₂

Molecular Weight: 89.09

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Light, dust generation, moisture.

Incompatibilities with Other Materials: Strong oxidizing agents.

Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, carbon dioxide.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 302-72-7: AY2980000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 302-72-7: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No data available.

Teratogenicity: No data available.

Reproductive Effects: No data available.

Mutagenicity: No data available.

Neurotoxicity: No data available.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. Structure of the product is closely related to the natural amino acid L-alanine and may therefore be degraded microbiologically.

Environmental: No information available.

Physical: No information available.

Other: No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	Not Regulated
Hazard Class:		
UN Number:		
Packing Group:		
Additional Info:		OXALIC ACID

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 302-72-7 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 302-72-7 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 302-72-7: 0

Canada - DSL/NDSL

CAS# 302-72-7 is listed on Canada's DSL List.

Canada - WHMIS

WHMIS: Not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

DL-Lysine monohydrochloride

ACC# 43661

Section 1 - Chemical Product and Company Identification

MSDS Name: DL-Lysine monohydrochloride

Catalog Numbers: AC413370000, AC413370250, AC413371000, ACE1176833, ACE1176841

Synonyms: None known.

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
70-53-1	DL-Lysine monohydrochloride	99	200-739-0

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white to light yellow crystalline powder.

Caution! May cause eye, skin, and respiratory tract irritation. The toxicological properties of this material have not been fully investigated.

Target Organs: None known.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation. May be harmful if absorbed through the skin.

Ingestion: May cause irritation of the digestive tract. May be harmful if swallowed.

Inhalation: May cause respiratory tract irritation. May be harmful if inhaled.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. If irritation develops, get medical aid.

Skin: Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: Do not induce vomiting. Get medical aid if irritation or symptoms occur.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or chemical foam.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 1; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation. Do not let this chemical enter the environment.

Section 7 - Handling and Storage

Handling: Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation.

Storage: Store in a cool, dry place. Store in a tightly closed container.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
DL-Lysine monohydrochloride	none listed	none listed	none listed

OSHA Vacated PELs: DL-Lysine monohydrochloride: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Crystalline powder

Appearance: white to light yellow

Odor: Not available.

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 267 deg C

Decomposition Temperature: Not available.

Solubility: Not available.

Specific Gravity/Density: Not available.

Molecular Formula: C₆H₁₄N₂O₂.HCl

Molecular Weight: 182.65

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, dust generation, temperatures above 150°C.

Incompatibilities with Other Materials: Strong oxidizing agents

Hazardous Decomposition Products: Hydrogen chloride, nitrogen oxides, carbon monoxide, carbon monoxide, carbon dioxide.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 70-53-1 unlisted.

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 70-53-1: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information available.

Physical: No information available.

Other: Do not empty into drains.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated.	Not regulated.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 70-53-1 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313

No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 70-53-1 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 70-53-1: 0

Canada - DSL/NDSL

CAS# 70-53-1 is listed on Canada's DSL List.

Canada - WHMIS

not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

DL-Methionine

ACC# 17927

Section 1 - Chemical Product and Company Identification

MSDS Name: DL-Methionine

Catalog Numbers: AC125650000, AC125650025, AC125651000, AC125652500, AC295110000

Synonyms: DL-2-Amino-4-(methylthio)butyric acid; Racemethionine.

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
59-51-8	DL-Methionine	>99	200-432-1

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white powder.

Caution! May cause eye, skin, and respiratory tract irritation.

Target Organs: No data found.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation.

Ingestion: May cause irritation of the digestive tract. The toxicological properties of this substance have not been fully investigated.

Inhalation: May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated.

Chronic: Adverse reproductive effects have been reported in animals.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Dust from this material can form explosive organic dust cloud.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 1; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container

tightly closed. Avoid ingestion and inhalation.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep refrigerated. (Store below 4°C/39°F.)

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
DL-Methionine	none listed	none listed	none listed

OSHA Vacated PELs: DL-Methionine: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Powder

Appearance: white

Odor: faint odor

pH: 5.6-6.1 (1% aq soln)

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 270-281 deg C (dec)

Decomposition Temperature: 281 deg C

Solubility: 33.81 g/l @ 25°C

Specific Gravity/Density: 1.3400 g/cm³

Molecular Formula: C₅H₁₁NO₂S

Molecular Weight: 149.21

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Dust generation, excess heat.

Incompatibilities with Other Materials: Strong oxidizing agents.

Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, oxides of sulfur, oxides of sulfur, carbon dioxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 59-51-8: PD0456000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 59-51-8: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No data available.

Teratogenicity: No data available.

Reproductive Effects: Adverse reproductive effects have occurred in experimental animals.

Mutagenicity: No data available.

Neurotoxicity: No data available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not Regulated	Not Regulated
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 59-51-8 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 59-51-8: fire.

Section 313

No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 59-51-8 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 59-51-8: 0

Canada - DSL/NDSL

CAS# 59-51-8 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2A.

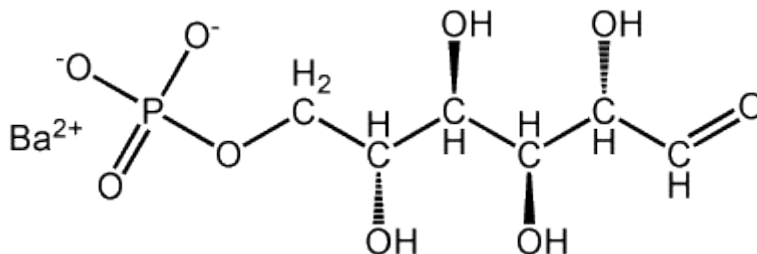
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

D-Mannose, 6-(dihydrogen phosphate), barium salt (1:1)

Formula $C_6H_{13}O_9P.Ba$

Structure



Registry Numbers and Inventories.

CAS	94030-87-2
NIH PubChem CID	3796094 (SID)
EC (EINECS/ELINCS)	301-693-5
UN (DOT)	1564
Beilstein/Gmelin	3922394
Beilstein Reference	4-01-00-04383
Korea ECL	Listed

Properties.

Formula	$C_6H_{11}BaO_9P$
Formula mass	397.46

Hazards and Protection.

Storage	Keep in a cool, dry, dark location in a tightly sealed container or cylinder. Keep away from incompatible materials, ignition sources and untrained individuals. Secure and label area. Protect containers/cylinders from physical damage.
Handling	All chemicals should be considered hazardous. Avoid direct physical contact. Use appropriate, approved safety equipment. Untrained individuals should not handle this chemical or its container. Handling should occur in a chemical fume hood.
Protection	Wear appropriate protective gloves, clothing and goggles.
Respirators	Wear positive pressure self-contained breathing apparatus (SCBA).
Small spills/leaks	ELIMINATE all ignition sources. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Stop leak if you can do it without risk. Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers. DO NOT GET WATER INSIDE CONTAINERS.
Stability	No data.

Fire.

Fire fighting	Extinguish using agent most appropriate for surrounding fire.
Fire potential	Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes.
Hazards	Contact with metals may evolve flammable hydrogen gas.
Combustion products	Fire may produce irritating, corrosive and/or toxic gases.

Health.

Exposure effects

Ingestion See Inhalation.

Inhalation TOXIC; inhalation, ingestion, or skin contact with material may cause severe injury or death. Effects of contact or inhalation may be delayed.

Skin Contact with molten substance may cause severe burns to skin and eyes. See Inhalation.

Eyes See Inhalation.

First aid

Ingestion Seek medical assistance.

Inhalation Move victim to fresh air. Apply artificial respiration if victim is not breathing. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Administer oxygen if breathing is difficult.

Skin Remove and isolate contaminated clothing and shoes. Immediately flush with running water for at least 20 minutes. For minor skin contact, avoid spreading material on unaffected skin.

Eyes Immediately flush with running water for at least 20 minutes.

Transportation.

UN number 1564

Response guide [154](#)

Hazard class 6.1



Packing Group II; III

Material Safety Data Sheet

Dowex 1x8-50 Ion-Exchange Resin

ACC# 51769

Section 1 - Chemical Product and Company Identification

MSDS Name: Dowex 1x8-50 Ion-Exchange Resin

Catalog Numbers: AC202980000, AC202981000, AC202985000

Synonyms: None.

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
69772-06-1	Dowex(R) 1X8-50 ion-exchange resin	100	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: tan solid.

Caution! May cause eye and skin irritation. May cause respiratory and digestive tract irritation. The toxicological properties of this material have not been fully investigated.

Target Organs: None known.

Potential Health Effects

Eye: May cause eye irritation. The toxicological properties of this material have not been fully investigated.

Skin: May cause skin irritation. The toxicological properties of this material have not been fully investigated.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. The toxicological properties of this substance have not been fully investigated.

Inhalation: May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid immediately. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use agent most appropriate to extinguish fire. Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: N/A

Upper: N/A

NFPA Rating: (estimated) Health: ; Flammability: ; Instability:

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up, then place into a suitable container for disposal. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before

reuse. Use with adequate ventilation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Keep container closed when not in use. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Dowex(R) 1X8-50 ion-exchange resin	none listed	none listed	none listed

OSHA Vacated PELs: Dowex(R) 1X8-50 ion-exchange resin: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: tan

Odor: None reported.

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: Not available.

Decomposition Temperature: Not available.

Solubility: insoluble

Specific Gravity/Density: Not available.

Molecular Formula: Not available.

Molecular Weight: Not available.

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, strong oxidants.

Incompatibilities with Other Materials: Oxidizing agents.

Hazardous Decomposition Products: Hydrogen chloride, nitrogen oxides, carbon monoxide, carbon dioxide, nitrogen gas.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 69772-06-1 unlisted.

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 69772-06-1: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: No information available.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 69772-06-1 is not listed on the TSCA inventory. It is for research and development use only.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 69772-06-1 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

S 37 Wear suitable gloves.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 28A After contact with skin, wash immediately with plenty of water

WGK (Water Danger/Protection)

CAS# 69772-06-1: No information available.

Canada - DSL/NDSL

None of the chemicals in this product are listed on the DSL or NDSL list.

Canada - WHMIS

WHMIS: Not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Drierite®, with indicator

ACC# 97068

Section 1 - Chemical Product and Company Identification

MSDS Name: Drierite®, with indicator

Catalog Numbers: AC219080000, AC219080020, AC219080050, AC219085000, AC219090000, AC219090020, AC219090020, AC219090050, AC219095000, AC219100000, AC219100020, AC219105000, AC219105000, AC350010000, AC350010020, AC350015000

Synonyms: Calcium sulfate.

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7778-18-9	Drierite®	96.75	231-900-3
7646-79-9	Cobalt chloride	3.25	231-589-4

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white granules.

Warning! Possible cancer hazard. May cause cancer based on animal data. May cause allergic respiratory and skin reaction. May cause eye, skin, and respiratory tract irritation. Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. May cause cancer by inhalation. Hygroscopic (absorbs moisture from the air).

Target Organs: Respiratory system, skin.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation. May cause skin sensitization, an allergic reaction, which becomes evident upon re-exposure to this material. May be harmful if absorbed through the skin.

Ingestion: May cause irritation of the digestive tract. May be harmful if swallowed.

Inhalation: May cause allergic respiratory reaction. May cause respiratory tract irritation. May be harmful if inhaled.

Chronic: May cause cancer according to animal studies. Adverse reproductive effects have been reported in animals. Repeated or prolonged exposure may cause allergic reactions in sensitive individuals. Animal studies have reported the development of tumors.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: Do not induce vomiting. Get medical aid.

Inhalation: Get medical aid immediately. Remove from exposure and move to fresh air immediately. If breathing is difficult, give oxygen. Do not use mouth-to-mouth resuscitation if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media: Use extinguishing media most appropriate for the surrounding fire.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 1

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container.

Wear a self contained breathing apparatus and appropriate personal protection. (See Exposure Controls, Personal Protection section). Avoid generating dusty conditions. Provide ventilation. Do not let this chemical enter the environment.

Section 7 - Handling and Storage

Handling: Minimize dust generation and accumulation. Do not get in eyes, on skin, or on clothing. Do not ingest or inhale. Use only in a chemical fume hood.

Storage: Store in a cool, dry place. Store in a tightly closed container.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use only under a chemical fume hood.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Drierite®	10 mg/m ³ TWA (inhalable fraction)	10 mg/m ³ TWA (total dust); 5 mg/m ³ TWA (respirable dust)	15 mg/m ³ TWA (total dust); 5 mg/m ³ TWA (respirable fraction)
Cobalt chloride	0.02 mg/m ³ TWA (as Co) (listed under Cobalt, inorganic compounds).	none listed	none listed

OSHA Vacated PELs: Drierite®: 15 mg/m³ TWA; 5 mg/m³ TWA (respirable fraction)
Cobalt chloride: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Granules

Appearance: white

Odor: none reported

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point:1450 deg C (decom)
Decomposition Temperature:Not available.
Solubility: Slightly soluble.
Specific Gravity/Density:2.960
Molecular Formula:CaO4S
Molecular Weight:136.14

Section 10 - Stability and Reactivity

Chemical Stability: Hygroscopic: absorbs moisture or water from the air.
Conditions to Avoid: Incompatible materials, dust generation, excess heat, exposure to moist air or water.
Incompatibilities with Other Materials: Strong oxidizing agents, strong acids, aluminum, azo, diazo, and hydrazines (e.g. dimethyl hydrazine, hydrazine, methyl hydrazine), alkali metals.
Hazardous Decomposition Products: Oxides of sulfur.
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:
CAS# 7778-18-9: WS6920000
CAS# 7646-79-9: GF9800000
LD50/LC50:
Not available.

CAS# 7646-79-9:
Oral, mouse: LD50 = 80 mg/kg;
Oral, rat: LD50 = 80 mg/kg;
Oral, rat: LD50 = 418 mg/kg;

Carcinogenicity:
CAS# 7778-18-9: Not listed by ACGIH, IARC, NTP, or CA Prop 65.
CAS# 7646-79-9:

- **ACGIH:** A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans (listed as 'Cobalt, inorganic compounds').
- **California:** Not listed.
- **NTP:** Not listed.
- **IARC:** Group 2B carcinogen

Epidemiology: Tumorigenic effects have been reported in experimental animals.IARC

Group 2B: Proven animal carcinogenic substance of potential relevance to humans. ACGIH has labeled this substance as a confirmed animal carcinogen.

Teratogenicity: Teratogenic effects have occurred in experimental animals.

Reproductive Effects: Adverse reproductive effects have occurred in experimental animals.

Mutagenicity: Mutagenic effects have occurred in experimental animals.

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information available.

Physical: No information available.

Other: Do not empty into drains.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOL (Cobalt chloride)	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOL (Cobalt chloride)
Hazard Class:	9	9
UN Number:	UN3077	UN3077
Packing Group:	III	III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7778-18-9 is listed on the TSCA inventory.

CAS# 7646-79-9 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

SARA Codes

CAS # 7646-79-9: immediate, delayed.

Section 313

This material contains Cobalt chloride (listed as Cobalt, inorganic compounds), 3.25%, (CAS# 7646-79-9) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

CAS# 7646-79-9 (listed as Cobalt compounds) is listed as a hazardous air pollutant (HAP).

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7778-18-9 can be found on the following state right to know lists: New Jersey, Pennsylvania, Minnesota, Massachusetts.

CAS# 7646-79-9 can be found on the following state right to know lists: New Jersey, (listed as Cobalt compounds), Pennsylvania, (listed as Cobalt compounds), Minnesota, (listed as Cobalt, inorganic compounds).

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

T N

Risk Phrases:

R 42/43 May cause sensitization by inhalation and skin contact.

R 49 May cause cancer by inhalation.

R 51/53 Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Phrases:

S 22 Do not breathe dust.

S 29 Do not empty into drains.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 53 Avoid exposure - obtain special instructions before use.

S 61 Avoid release to the environment. Refer to special instructions /safety data sheets.

WGK (Water Danger/Protection)

CAS# 7778-18-9: 0

CAS# 7646-79-9: 2

Canada - DSL/NDSL

CAS# 7778-18-9 is listed on Canada's DSL List.

CAS# 7646-79-9 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2A, D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 7646-79-9 is listed on the Canadian Ingredient Disclosure List.

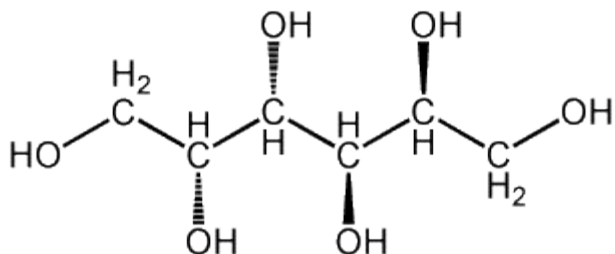
Galactitol

- Dulcitol
- Dulcite
- Euonymit
- Melampyrin
- Dulcose
- (2R,3S,4R,5S)-Hexane-1,2,3,4,5,6-hexol

Formula

C₆H₁₄O₆

Structure



Description

White crystals.

Uses

In people with galactokinase deficiency, excess galactitol formation in the lens of the eye leads to cataracts.

Registry Numbers and Inventories.

CAS	608-66-2
NIH PubChem CID	11850
EC (EINECS/ELINCS)	210-165-2
Merck	13,4353
Beilstein/Gmelin	1721903
Beilstein Reference	4-01-00-02844
Canada DSL/NDSL	DSL
US TSCA	Listed
Australia AICS	Listed
New Zealand	Listed

Properties.

Formula	C ₆ H ₁₄ O ₆
Formula mass	182.17
Melting point, °C	168 - 169
Boiling point, °C	563
Vapor pressure, mm _{Hg}	5E-15 (25 C)

Density	1.466 g/cm ³ (15 C)
Solubility in water	Very soluble
pKa/pKb	13.14 (pKa)
Partition coefficient, pK_{ow}	-4.67
Heat of fusion	65.10 kJ/mol
Heat of vaporization	97.2 kJ/mol
Heat of combustion	-3054 kJ/mol

Hazards and Protection.

Storage	Keep container closed when not in use. Store in a cool, dry, well-ventilated area away from incompatible substances.
Handling	Wash thoroughly after handling. Use with adequate ventilation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.
Protection	Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166. Skin: Wear appropriate protective gloves to prevent skin exposure. Clothing: Wear appropriate protective clothing to prevent skin exposure.
Respirators	Follow the OSHA respirator regulations found in 29CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.
Small spills/leaks	Clean up spills immediately, using the appropriate protective equipment. Sweep up or absorb material, then place into a suitable clean, dry, closed container for disposal. Provide ventilation.
Stability	Stable under normal temperatures and pressures.
Incompatibilities	Oxidizing agents.
Decomposition	Carbon monoxide, carbon dioxide.

Fire.

Flash Point, °C	293
Fire fighting	Wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Extinguishing media: Use agent most appropriate to extinguish fire. In case of fire use water spray, dry chemical, carbon dioxide, or appropriate foam.

Health.

Exposure effects

Ingestion

May cause gastrointestinal irritation with nausea, vomiting and diarrhea. The toxicological properties of this substance have not been fully investigated.

Inhalation May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated.

Skin May cause skin irritation. The toxicological properties of this material have not been fully investigated.

Eyes May cause eye irritation. The toxicological properties of this material have not been fully investigated.

First aid

Ingestion If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Skin Get medical aid. Flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Eyes Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Transportation.

HS Code 2905 49 90

Material Safety Data Sheet

Albumin, egg (powder)

ACC# 00093

Section 1 - Chemical Product and Company Identification

MSDS Name: Albumin, egg (powder)

Catalog Numbers: AC400450000, AC400450500, 40045-1000, 40045-5000

Synonyms: Egg albumin; Egg white.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
9006-59-1	Albumin egg	100	232-692-7

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: fine powder.

Caution! May cause eye, skin, and respiratory tract irritation. Heat sensitive. The toxicological properties of this material have not been fully investigated.

Target Organs: None.

Potential Health Effects

Eye: Dust may cause mechanical irritation.

Skin: May cause skin irritation. May be harmful if absorbed through the skin.

Ingestion: Ingestion of large amounts may cause gastrointestinal irritation. May be harmful if swallowed.

Inhalation: May cause respiratory tract irritation. May be harmful if inhaled.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Treat symptomatically and supportively. Get medical aid immediately.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion

and inhalation.

Storage: Store in a cool, dry place. Store in a tightly closed container.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Albumin egg	none listed	none listed	none listed

OSHA Vacated PELs: Albumin egg: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Powder

Appearance: yellow-white - fine

Odor: Not available.

pH: 6 - 8

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: 61 deg C @ 760 mm Hg

Freezing/Melting Point: 0 deg C

Decomposition Temperature: 60 deg C

Solubility: Soluble.

Specific Gravity/Density: Not available.

Molecular Formula: Not available.

Molecular Weight: Not available.

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: High temperatures, incompatible materials, dust generation.

Incompatibilities with Other Materials: Strong oxidizers.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 9006-59-1: AY9384000

LD50/LC50:

CAS# 9006-59-1:

Oral, mouse: LD50 = >24 gm/kg;

Carcinogenicity:

CAS# 9006-59-1: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information reported.

Physical: No information available.

Other: None.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR

Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not Regulated	Not Regulated
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 9006-59-1 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 9006-59-1 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 9006-59-1: No information available.

Canada - DSL/NDSL

CAS# 9006-59-1 is listed on Canada's DSL List.

Canada - WHMIS

not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Eosin Y

ACC# 60240

Section 1 - Chemical Product and Company Identification

MSDS Name: Eosin Y

Catalog Numbers: BP2419-100, BP2419-25, E511-100, E511-25, NC9215708, NC9412829, NC9607248

Synonyms: Acid Red 87; Bromoeosine; Disodium Eosine; Eosine Yellowish; Tetrabromfluorescein, CI 45380.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
17372-87-1	ACID RED 87	100	241-409-6

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: red to brown solid.

Caution! May cause eye and skin irritation. May cause respiratory and digestive tract irritation. The toxicological properties of this material have not been fully investigated.

Target Organs: No data found.

Potential Health Effects

Eye: May cause eye irritation. This product contains an anionic dye. Similar dyes have not caused injury to the cornea or conjunctiva in documented exposure cases with human or rabbit eyes.

Skin: May cause skin irritation.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. The toxicological properties of this substance have not been fully investigated.

Inhalation: May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Get medical aid immediately.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: The use of sodium chloride as antidotal treatment for bromine salt overdose should be made only by qualified medical personnel (Medical Toxicology, 1988).

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: In case of fire, use water, dry chemical, chemical foam, or alcohol-resistant foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Sweep up, then place into a suitable container for disposal. Avoid generating dusty conditions.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with skin and eyes. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
ACID RED 87	none listed	none listed	none listed

OSHA Vacated PELs: ACID RED 87: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: red to brown

Odor: none reported

pH: Not available.

Vapor Pressure: Negligible.

Vapor Density: Not applicable.

Evaporation Rate: Negligible.

Viscosity: Not available.

Boiling Point: Not applicable.

Freezing/Melting Point: Not available.

Decomposition Temperature: Not available.

Solubility: Soluble in water.
Specific Gravity/Density: Not available.
Molecular Formula: C₂₀H₈Br₄O₅.2Na
Molecular Weight: 693.65

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: High temperatures, incompatible materials.
Incompatibilities with Other Materials: Strong oxidizers.
Hazardous Decomposition Products: Carbon monoxide, carbon dioxide, hydrogen bromide.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 17372-87-1: LM5850000
LD50/LC50:
CAS# 17372-87-1:
Oral, mouse: LD50 = 2344 mg/kg;

Carcinogenicity:
CAS# 17372-87-1: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.
Teratogenicity: No information available.
Reproductive Effects: No information available.
Mutagenicity: Please refer to RTECS# LM5850000 for specific information.
Neurotoxicity: No information available.
Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.
Environmental: No information reported.
Physical: No information available.
Other: No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Please contact Fisher Scientific for shipping information	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 17372-87-1 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 17372-87-1: immediate.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 17372-87-1 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

WGK (Water Danger/Protection)

CAS# 17372-87-1: 1

Canada - DSL/NDSL

CAS# 17372-87-1 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

FISHER SCIENTIFIC, CHEMICAL DIV. -- E51225 ERIOCHROME (R) BLACK T -- 6810-00-070-7541

=====
===== Product Identification =====

Product ID:E51225 ERIOCHROME (R) BLACK T
MSDS Date:02/01/1995
FSC:6810
NIIN:00-070-7541
MSDS Number: BCXHD
=== Responsible Party ===
Company Name:FISHER SCIENTIFIC, CHEMICAL DIV.
Address:1 REAGENT LANE
City:FAIR LAWN
State:NJ
ZIP:07410
Country:US
Info Phone Num:201-796-7100 OR 201-796-7523
Emergency Phone Num:201-796-7100/800-424-9300 (CHEMTREC)
Preparer's Name:GASTON L. PILLORI
CAGE:1B464

=== Contractor Identification ===
Company Name:FISHER SCIENTIFIC CO. CHEMICAL MFG DIV
Address:1 REAGENT LANE
Box:City:FAIRLAWN
State:NJ
ZIP:07410-2802
Country:US
Phone:201-796-7100
CAGE:1B464

=====
===== Composition/Information on Ingredients =====

Ingred Name:ERICHROME BLACK T
CAS:1787-61-7
Fraction by Wt: 100%
Other REC Limits:NONE RECOMMENDED

=====
===== Hazards Identification =====

LD50 LC50 Mixture:ORAL, RAT LD50 5000MG/KG
Routes of Entry: Inhalation:YES Skin:YES Ingestion:YES
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:INHAL:IRRIT.SKIN:IRRIT,REP/PROL EXPO
DERMATITIS.EYE:IRRIT,REP/PROL EXPO CONJUNCTIVITIS.INGEST:NO DATA
AVAIABLE.
Explanation of Carcinogenicity:PER MSDS:CARCINOGEN STATUS:NONE.
Effects of Overexposure:INHAL IRRIT, SKIN IRRIT, DERAMTITIS,
CONJUCTIVITIS.
Medical Cond Aggravated by Exposure:NONE SPECIFIED BY MANUFACTURER.
TARGET EFFECTS:NO DATA AVAILABLE.

=====
===== First Aid Measures =====

First Aid:INHAL:REMOVE TO FRESH AIR IMMED.PERFORM ART RESP IF
NECESSARY.SKIN:REMOVE CONTAMIN CLOTH/SHOES IMMED.WASH W/SOAP/MILD
DETERG/LG AMTS OF WATER 15-20MINS.EYE:WASH IMMED W/LG AMTS OF
WATER/NORMAL SALINE 15-20MINS.INGEST:VOMIT OCCURS KEEP HEADLOWER
THAN HIPS TO HELP PREVENT ASPIRATION.TREAT SYMPT/SUPP.IN ALL CASES
GET MED ATTN.ANTIDOTE:NO SPECIFIC ANTIDOTE.TREAT
SYMPTOMATICALLY/SUPPORTIVELY.

=====
===== Fire Fighting Measures =====

Flash Point:NP
Autoignition Temp:Autoignition Temp Text:NP
Lower Limits:NP
Upper Limits:NP
Extinguishing Media:DRY CHEM,CARBON DIOXIDE,WATERSPRAY,REGULAR
FOAM.LG:USE WATERSPRAY,FOG,REG FOAM.
Fire Fighting Procedures:MOVE CNTNR FROM FIRE AREA W/O RISK.DON'T
SCATTER SPILL MATL W/HGIH-PRESSURE WATERSTREAMS.DIKE FIRE-CNTRL
WATER FOR DISPO.USE AGENTS SUITABLE TYPE OF (SUPPLEMEN)
Unusual Fire/Explosion Hazard:SLIGHT FIRE HAZ WHEN EXPO TO
HEAT/FLAME.DUST/AIR MIXTURES MAY IGNITE/EXPLODE.

=====
===== Accidental Release Measures =====

Spill Release Procedures:SWEEP UP & PLACE IN SUITABLE CLEAN,DRY CNTNRS
FOR RECLAMATION OR LATER DISPOSAL. DO NOT FLUSH SPILLED MATL INTO
SEWER.KEEP UNNECESSARY PEOPLE AWAY.

=====
===== Handling and Storage =====

Handling and Storage Precautions:OBSERVE ALL FED/STATE/LOC REGS WHEN
STORING SUBSTANCE.KEEP IN TIGHTLY CLOSED CNTNR.STORE IN COOL DRY
VENTILATED AREA.STORE AT ROOM TEMEPATURE.
Other Precautions:STORE AWAY FROM INCOMPATIBLE SUBSTANCES.

=====
===== Exposure Controls/Personal Protection =====

Respiratory Protection:SPEC RESP SELECTED MUST BE BASED ON CONTAMIN
LEVELS IN WORKAREA,ON SPECIFIC OPERATION,MUST NOT EXCEED WORKING
LIMITS OF RESP,JOINTLY APPROVED BY NIOSH/MSHA.
Ventilation:PROVIDE LOCAL EXHAUST VENTILATION.VNETILLATION EQPMT SHOULD
BE EXPLO-PROOF IF EXPLO CONC OF DUST/VAP/FUMES ARE PRESENT.
Protective Gloves:APPROPRIATE PROTECTIVE GLOVES.

Eye Protection:SPLASH-PROOF/DUST-RESIST SAF GOGG.
Other Protective Equipment:WEAR APPROPRIATE PROT (IMPERVIOUS)CLOTH/EQPMT
TO PREVENT REP/PROL SKIN CONTACT W/SUBSTANCE.EYEWASH FOUNTIAN W/IN
WORKAREA
Work Hygienic Practices:HMIS:LAUNDER CONTAMIN CLOTH BEF REUSE.
Supplemental Safety and Health
PH:3 (20G/L H2O). FIREFIGHTING:SURROUNDING FIRE.AVOID BREATH HAZ
VAP,KEEP UPWIND.

===== Physical/Chemical Properties =====

HCC:N1
Boiling Pt:B.P. Text:NP
Melt/Freeze Pt:M.P/F.P Text:374F,190C
Decomp Temp:Decomp Text:374F,190C
Vapor Pres:NP
Vapor Density:NP
Spec Gravity:N/AVAI
pH:SUPPLY
Viscosity:NP
Evaporation Rate & Reference:NEGL (N-BUTYL ACETATE=1)
Solubility in Water:APPRECIABLE,80%@100C
Appearance and Odor:ODORLESS, BROWYNISH-BLACK TO BLACK POWDER W/FAINT
METALLIC SHEEN.
Percent Volatiles by Volume:0
Corrosion Rate:NP

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES
STRONG OXIDIZERS, REDUCING AGENTS.
Stability Condition to Avoid:MAY BURN BUT DOES NOT IGN READILY.AVOID
CONTACT W/STRONG OXIDIZERS,EXCESSIVE HEAT/SPARKS/OPEN FLAMES.
Hazardous Decomposition Products:THERMAL DECOMPO PROD MAY INCLUDE TOXIC
OXIDES OF CARBON, NITROGEN, SULFUR & SODIUM.

===== Disposal Considerations =====

Waste Disposal Methods:OBSERVE ALL FED/STATE/LOC REGS WHEN DISPOSING
SUBSTANCE.

Disclaimer (provided with this information by the compiling agencies):
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assume responsibility for the suitability of this information to their
particular situation.

FISHER SCIENTIFIC -- SODIUM DIETHYLDITHIOCARBAMATE TRIHYDRATE, S287-100 -- 6810-00N092920

=====
===== Product Identification =====

Product ID:SODIUM DIETHYLDITHIOCARBAMATE TRIHYDRATE, S287-100
MSDS Date:12/12/1997
FSC:6810
NIIN:00N092920
Status Code:A
MSDS Number: CJVWG
=== Responsible Party ===
Company Name:FISHER SCIENTIFIC
Address:ONE REAGENT LANE
City:FAIRLAWN
State:NJ
ZIP:07410
Country:US
Info Phone Num:201-796-7100
Emergency Phone Num:201-796-7100
Chemtrec Ind/Phone:(800)424-9300
CAGE:1B464

==== Contractor Identification ====

Company Name:FISHER SCIENTIFIC CO. CHEMICAL MFG DIV
Address:1 REAGENT LANE
Box:City:FAIRLAWN
State:NJ
ZIP:07410-2802
Country:US
Phone:201-796-7100
CAGE:1B464

=====
===== Composition/Information on Ingredients =====

Ingred Name:CARBAMODITHIOIC ACID, DIETHYL-, SODIUM SALT, TRIHYDRATE;
(DIETHYLCARBAMODITHIOIC ACID SODIUM SALT TRIHYDRATE) LD50: (ORAL,
RAT) 1500 MG/KG EINECS/ELINCS: UNLISTED.
CAS:20624-25-3
RTECS #:EZ6550000
= Wt:100.

=====
===== Hazards Identification =====

LD50 LC50 Mixture:SEE INGREDIENT
Routes of Entry: Inhalation:YES Skin:YES Ingestion:YES
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:EYE: MAY CAUSE EYE IRRITATION. SKIN:
MAY CAUSE SKIN IRRITATION. INGESTION: THE TOXICOLOGICAL PROPERTIES
OF THIS SUBSTANCE HAVE NOT BEEN FULLY INVESTIGATED. MAY BE HARMFUL
IF SWALLOWED. EXPOSURE TO SIM ILAR COMPOUNDS IN COMBINATION WITH
ALCOHOLS HAS CAUSED NAUSEA, VOMITING, BREATHING DIFFICULTY AND
HYPOTENSION. INHALATION: MAY CAUSE RESPIRATORY TRACT IRRITATION.
THE TOXICOLOGICAL PROPERTIES OF THIS SUBSTANCE HAVE NOT BEEN FULLY
INVESTIGATED. CHRONIC: NO INFORMATION FOUND. MAY CAUSE REPRODUCTIVE
AND FETAL EFFECTS. DITHIOCARBAMATE COMPOUNDS MAY CAUSE CANCER.
TARGET ORGANS: NONE.
Effects of Overexposure:SEE HEALTH HAZARDS.

=====
===== First Aid Measures =====

First Aid: EYES: IMMEDIATELY FLUSH EYES WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES, OCCASIONALLY LIFTING UPPER & LOWER LIDS. GET MEDICAL AID.
SKIN: FLUSH SKIN WITH PLENTY OF SOAP & WATER FOR AT LEAST 15 MINUTES WHILE REMOVING CONTAMINATED CLOTHING & SHOES. GET MEDICAL AID IF IRRITATION DEVELOPS OR PERSISTS. INGEST: IF VICTIM IS CONSCIOUS & ALERT, GIVE 2-4 CUPFULS OF MILK OR WATER. GET MEDICAL AID IMMEDIATELY. INHALATION: REMOVE FROM EXPOSURE TO FRESH AIR IMMEDIATELY. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN. GET MEDICAL AID. NOTES TO PHYSICIAN: TREAT SYMPTOMATICALLY & SUPPORTIVELY. ANTIDOTE: NO SPECIFIC ANTIDOTE EXISTS.

=====
===== Fire Fighting Measures =====

Lower Limits: NOT AVAILABLE
Upper Limits: NOT AVAILABLE
Extinguishing Media: USE WATER SPRAY, DRY CHEMICAL OR CARBON DIOXIDE.
Fire Fighting Procedures: USE NIOSH APPROVED SCBA AND FULL PROTECTIVE EQUIPMENT.

=====
===== Accidental Release Measures =====

Spill Release Procedures: USE PROPER PERSONAL PROTECTIVE EQUIPMENT AS INDICATED IN SECTION 8, EXPOSURE CONTROLS, PERSONAL PROTECTION. SWEEP UP, THEN PLACE INTO A SUITABLE CONTAINER FOR DISPOSAL. AVOID GENERATING DUSTY CONDITIONS.

=====
===== Handling and Storage =====

Handling and Storage Precautions: STORE IN A COOL, DRY, WELL-VENTILATED AREA AWAY FROM INCOMPATIBLE SUBSTANCES. KEEP AWAY FROM WATER.
Other Precautions: WASH THOROUGHLY AFTER HANDLING. REMOVE CONTAMINATED CLOTHING AND WASH BEFORE REUSE. USE WITH ADEQUATE VENTILATION. MINIMIZE DUST GENERATION AND ACCUMULATION. AVOID CONTACT WITH SKIN AND EYES. KEEP CONTAINER TIGHTLY CLOSED. AVOID INGESTION AND INHALATION.

=====
===== Exposure Controls/Personal Protection =====

Respiratory Protection: FOLLOW THE OSHA RESPIRATOR REGULATIONS FOUND IN 29 CFR 1910.134 OR EUROPEAN STANDARD EN 149. ALWAYS USE A NIOSH OR EUROPEAN STANDARD EN 149 APPROVED RESPIRATOR WHEN NECESSARY.
Ventilation: USE ADEQUATE VENTILATION TO KEEP AIRBORNE CONCENTRATIONS LOW.
Protective Gloves: IMPERVIOUS GLOVES.
Eye Protection: ANSI APPROVED CHEMICAL WORKERS GOGGLES.
Other Protective Equipment: EYE WASH AND DELUGE SHOWER MEETING ANSI DESIGN CRITERIA. WEAR APPROPRIATE PROTECTIVE CLOTHING TO PREVENT SKIN EXPOSURE.
Supplemental Safety and Health
EXPOSURE LIMITS: DIETHYLCARBAMODITHIOIC ACID SODIUM SALT TRIHYDRATE:
ACGIH: NONE LISTED. NIOSH: NONE LISTED. OSHA - FINAL PELS: NONE LISTED. OSHA VACATED PELS: NO OSHA VACATED PELS ARE LISTED FOR THIS CHEMICAL. PHYSICAL DATA: MOLECULAR FORMULA: C5H10NS2NA3H2O.

===== Physical/Chemical Properties =====

Melt/Freeze Pt:=95.C, 203.F
Decomp Temp:Decomp Text:NOT AVAILABLE
Vapor Pres:NOT AVAILABLE
Vapor Density:5.9
Spec Gravity:NOT AVAILABLE
pH:NOT AVAILABLE
Viscosity:NOT AVAILABLE
Solubility in Water:SOLUBLE
Appearance and Odor:WHITE TO YELLOW SOLID; NO ODOR REPORTED.

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES
STRONG OXIDIZING AGENTS, MOISTURE.
Stability Condition to Avoid:HIGH TEMPERATURES, INCOMPATIBLE MATERIALS,
MOISTURE. STABLE UNDER NORMAL TEMPERATURES AND PRESSURES.
Hazardous Decomposition Products:NITROGEN OXIDES, CARBON MONOXIDE,
OXIDES OF SULFUR, CARBON DIOXIDE.

===== Toxicological Information =====

Toxicological Information:LD50/LC60: CAS #20624-25-3: ORAL, MOUSE: LD50
= 1500 MG/KG. CARCINOGENICITY: CAS #20624-25-3: NOT LISTED BY
ACGIH, IARC, NIOSH, NTP OR OSHA. EPIDEMIOLOGY: CERTAIN
DITHIOCARBAMATE COMPOUNDS HAVE BEEN REPORTED TO CAUSE ADVERSE
FETAL AND REPRODUCTIVE EFFECTS. IN ADDITION, THESE COMPOUNDS MAY
HAVE CARCINOGENIC POTENTIAL. TERATOGENICITY: NO INFO AVAILABLE.
NEUROTOXICITY: NO INFO AVAILABLE. MUTAGENICITY : PLEASE REFER TO
EZ6550000 FOR SPECIFIC INFO. OTHER STUDIES: NONE.

===== Ecological Information =====

Ecological:ECOTOXICITY: NO INFO AVAILABLE. ENVIRONMENTAL FATE: NO INFO
REPORTED. PHYSICAL/CHEMICAL: NO INFO AVAILABLE. OTHER: NONE.
--OTHER INFO: WGK (WATER DANGER/PROTECTION) - CAS #20624-25-3: 2.
CANADA - NONE OF THE CHEMS IN THIS PROD ARE LISTED ON THE DSL/NDL
LIST. THIS PROD HAS WHMIS CLASSIFICATION OF D2B. CAS #20624-25-3 IS
NOT LISTED ON CANADA'S INGREDIENT DISCLOSURE LIST.

===== Disposal Considerations =====

Waste Disposal Methods:DISPOSE OF IN A MANNER CONSISTENT WITH FEDERAL,
STATE AND LOCAL REGULATIONS. RCRA D-SERIES MAXIMUM CONCENTRATION OF
CONTAMINANTS: NONE LISTED. RCRA D-SERIES CHRONIC TOXICITY REFERENCE
LEVELS: NONE LISTED. RCRA F-SERIES: NONE LISTED. RCRA P-SERIES:
NONE LISTED. RCRA U-SERIES: NONE LISTED.

===== MSDS Transport Information =====

Transport Information:US DOT, IATA, RID/ADR, IMO, CANADA TDG: NO INFO
AVAILABLE.

===== Regulatory Information =====

SARA Title III Information:SECTION 302 (RQ): NONE OF THE CHEMICALS IN

THIS MATERIAL HAVE AN RQ. SECTION 302 (TPQ): NONE OF THE CHEMICALS IN THIS PRODUCT HAVE A TPQ. SARA CODES: CAS #20624-25-3: ACUTE. SECTION 313: NO CHEMICALS ARE REPORTABLE UNDER SECTION 313.

Federal Regulatory Information: CAS #20624-25-3 IS NOT ON TSCA INVENTORY. IT IS A HYDRATE & EXEMPT FROM TSCA INVENTORY REQS (40 CFR 720.3(U)(2)). HEALTH & SAFETY REPORTING LIST: NONE OF THE CHEMS ARE ON HEALTH & SAFETY REPORTING LIST. CHEM TEST RULES: NONE OF CHEMS IN PROD ARE UNDER CHEM TEST RULE. NONE OF CHEMS ARE LISTED UNDER TSCA SECTION 12B. NONE OF CHEMS IN THIS MATL HAVE SNUR UNDER TSCA. CLEAN AIR ACT: THIS MATL DOES NOT CONTAIN ANY HAZ AIR POLLUTANTS. THIS MATL DOES NOT CONTAIN ANY CLASS 1 OZONE DEPLETORS. THIS MATL DOES NOT CONTAIN ANY CLASS 2 OZONE DEPLETORS. CLEAN WATER ACT: NONE OF CHEMS IN THIS PROD ARE LISTED AS (OTHER INFO)

State Regulatory Information: CAS #20624-25-3 IS NOT PRESENT ON STATE LISTS FROM CA, PA, MN, MA, FL OR NJ. CALIFORNIA NO SIGNIFICANT RISK LEVEL: NONE OF THE CHEMICALS IN THIS PRODUCT ARE LISTED.

===== Other Information =====

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Material Safety Data Sheet

Ethylenediaminetetraacetic acid (EDTA), 99%

ACC# 95399

Section 1 - Chemical Product and Company Identification

MSDS Name: Ethylenediaminetetraacetic acid (EDTA), 99%

Catalog Numbers: AC118430000, AC118430010, AC118432500

Synonyms: Acetic acid, (ethylenedinitrilo)tetra-; 3,6-Diazaoctanedioic acid, 3,6-bis(carboxymethyl)-; Edetic acid; EDTA; EDTA (chelating agent); EDTA acid; Endrate; N,N'-1,2-Ethanediybis(N-(carboxymethyl)glycine); Ethylenediaminetetraacetic acid; Ethylenediamine-N,N,N',N'-tetraacetic acid; Ethylenedinitrilotetraacetic acid; Glycine, N,N'-1,2-ethanediybis(N-(carboxymethyl)-

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
60-00-4	Ethylenediaminetetraacetic acid	99	200-449-4

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: colorless to white crystals.

Warning! Causes respiratory tract irritation. Causes eye and skin irritation. May cause kidney damage. May cause reproductive and fetal effects.

Target Organs: Kidneys, eyes, skin.

Potential Health Effects

Eye: Causes eye irritation. Causes redness and pain.

Skin: Causes skin irritation. Causes redness and pain.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea.

Ingestion of large amounts can cause hypocalcemic tetany due to formation of calcium complexes. Exposure may cause kidney injury, muscle cramps, bone-marrow depression, and a generalized allergic reaction. Ingestion of large quantities may cause appreciable

systemic toxicity involving blood chemistry changes due to chelation properties.

Inhalation: Causes irritation of the mucous membrane and upper respiratory tract.

Chronic: May cause reproductive and fetal effects. Laboratory experiments have resulted in mutagenic effects. Chronic exposure may cause kidney damage.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Dusts at sufficient concentrations can form explosive mixtures with air. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 1; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with skin and eyes. Keep container tightly closed. Avoid breathing dust.

Storage: Do not store in direct sunlight. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Ethylenediaminetetraacetic acid	none listed	none listed	none listed

OSHA Vacated PELs: Ethylenediaminetetraacetic acid: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Crystals

Appearance: colorless to white

Odor: odorless

pH: Not available.

Vapor Pressure: Negligible.

Vapor Density: Not available.

Evaporation Rate:Negligible.
Viscosity: Not available.
Boiling Point: Not available.
Freezing/Melting Point:220 deg C
Decomposition Temperature:240 deg C
Solubility: Slightly soluble.
Specific Gravity/Density:0.86 @ 20C
Molecular Formula:C10H16N2O8
Molecular Weight:292.25

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions. Decarboxylates above 150C.
Conditions to Avoid: Dust generation, excess heat.
Incompatibilities with Other Materials: Strong oxidizing agents, strong bases, aluminum, copper, copper alloys, nickel.
Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, irritating and toxic fumes and gases, carbon dioxide.
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:
CAS# 60-00-4: AH4025000
LD50/LC50:
CAS# 60-00-4:
Oral, mouse: LD50 = 30 mg/kg;

Carcinogenicity:
CAS# 60-00-4: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.
Teratogenicity: Embryo or Fetus: Stunted fetus, oral-rat TDLo=7632mg/kg. Specific developmental abnormalities: cardiovascular, craniofacial, musculoskeletal, respiratory, and urogenital, oral-rat TDLo=7632mg/kg.
Reproductive Effects: Fertility: Post-implantation mortality, oral-rat TDLo=7632mg/kg.
Mutagenicity: Cytogenetic Analysis: intraperitoneal-mouse 50mmol/L. DNA Inhibition: hamster fibroblast 500ug/L, rabbit kidney 250umol/L. EDTA leads to morphological changes of chromatin & chromosome structure in plant & animal cells. A weak induction of gene mutations has been reported.
Neurotoxicity: No information available.
Other Studies:

Section 12 - Ecological Information

Ecotoxicity: Fish: Channel catfish: LC50 = 129-159 mg/L; 96Hr; UnspecifiedFish: Rainbow trout: LC50 = 340 mg/L; 24Hr; UnspecifiedFish: Bluegill/Sunfish: LC50 = 129-159 mg/L; 96Hr; UnspecifiedFish: Fathead Minnow: 100% Lethal = 750 ppm; 96 Hr; Static bioassayWater flea Daphnia: LC50 > 100 ppm; 96 Hr; Static bioassay If released to soil, EDTA is expected to complex with trace metals and alkaline earth metals present in the soil, thereby causing an increase in the total solubility of the metals. EDTA may eventually predominate as the Fe(III) chelate in acidic soils and as the Ca chelate in alkaline soils. Biodegradation of EDTA in aerobic soils is the dominant removal mechanism, although biodegradation in anaerobic soils is negligible. glycine. EDTA is not expected to bioaccumulate in aquatic organisms, adsorb to suspended solids or sediments or volatilize from water surfaces.

Environmental: EDTA and its chelates are expected to leach readily through soil and significant volatilization from soil is not expected. If released to water, EDTA is expected to complex with trace metals and alkaline earth metals. Biodegradation of EDTA is expected to take place relatively slowly under aerobic conditions and to be negligible under anaerobic conditions. Cometabolism has been suggested as the mechanism for EDTA biodegradation. EDTA may react with photochemically generated hydroxyl radicals (half-life 229 days) and it may photodegrade.

Physical: Compounds identified as possible biodegradation products of the ammonium ferric chelate of EDTA are as follows: ethylenediamine triacetic acid (ED3A), iminodiacetic acid (IDA), N,N-ethylenediamine diacetic acid (N,N-EDDA), N,N'-EDDA, ethylenediamine monoacetic acid (EDMA), nitrilotriacetic acid (NTA) and glycine. The following photodegradation products of Fe(III)-EDTA have been identified: carbon monoxide, formaldehyde, ED3A, N,N-EDDA, N,N'-EDDA, IDA, EDMA and glycine.

Other: None.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.

Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 60-00-4 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 60-00-4: 5000 lb final RQ; 2270 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313

No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

CAS# 60-00-4 is listed as a Hazardous Substance under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 60-00-4 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XI

Risk Phrases:

R 36/37/38 Irritating to eyes, respiratory system and skin.

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 37/39 Wear suitable gloves and eye/face protection.

WGK (Water Danger/Protection)

CAS# 60-00-4: 2

Canada - DSL/NDSL

CAS# 60-00-4 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

J.T. BAKER COMPANY -- FERRIC SULFATE N-HYDRATE, 2046 -- 6810-00N027348

=====
Product Identification
=====

Product ID:FERRIC SULFATE N-HYDRATE, 2046
MSDS Date:09/15/1989
FSC:6810
NIIN:00N027348
MSDS Number: BMRWQ
=== Responsible Party ===
Company Name:J.T. BAKER COMPANY
Address:222 RED SCHOOL LANE
City:PHILLIPSBURG
State:NJ
ZIP:08865-2219
Country:US
Info Phone Num:201-859-2151
Emergency Phone Num:201-859-2151
CAGE:70829
=== Contractor Identification ===
Company Name:MALLINCKRODT BAKER, INC.
Address:222 RED SCHOOL LANE
Box:City:PHILLIPSBURG
State:NJ
ZIP:08865
Country:US
Phone:800-582-2537
CAGE:70829

=====
Composition/Information on Ingredients
=====

Ingred Name:IRON (III) SULFATE; (FERRIC SULFATE)
CAS:10028-22-5
RTECS #:NO8505000
Fraction by Wt: 90-100%
OSHA PEL:1 MG/M3 (FE)
ACGIH TLV:1 MG/M3 (FE)
EPA Rpt Qty:1000 LBS
DOT Rpt Qty:1000 LBS

=====
Hazards Identification
=====

LD50 LC50 Mixture:NONE SPECIFIED BY MANUFACTURER.
Routes of Entry: Inhalation:YES Skin:YES Ingestion:YES
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:INHAL: IRRITATION OF UPPER RESPIRATORY
TRACT, IRRITATION OF MUCOUS MEMBRANES. SKIN: IRRITATION. EYE:
IRRITATION. INGEST: NAUSEA, VOMITING, GASTROINTESTINAL IRRITATION.
(CHRONIC) LIVER DAMAGE.
Explanation of Carcinogenicity:NOT RELEVANT
Effects of Overexposure:SEE HEALTH HAZARDS.
Medical Cond Aggravated by Exposure:NONE IDENTIFIED.

=====
First Aid Measures
=====

First Aid:INGEST: CALL MD. IF SWALLOWED, IF CONSCIOUS, GIVE LRG AMTS OF
WATER. INDUCE VOMIT. INHAL: REMOVE TO FRESH AIR. IF NOT BRTHG, GIVE

ARTF RESP. IF BRTHG DFCLT, GIVE OXYGEN. SKIN: IMMED FLUSH W/PLENTY OF WATER FOR AT LEAST 15 MIN WHILE REMOVING CONTAM CLTHG & SHOES. WASH CLTHG BEFORE REUSE. EYE: IMMED FLUSH WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES.

=====
===== Fire Fighting Measures =====

Flash Point Method:CC
Extinguishing Media:USE EXTINGUISHING MEDIA APPROPRIATE FOR SURROUNDING FIRE.
Fire Fighting Procedures:WEAR NIOSH/MSHA APPROVED SCBA & FULL PROTECTIVE EQUIPMENT .
Unusual Fire/Explosion Hazard:NONE IDENTIFIED.

=====
===== Accidental Release Measures =====

Spill Release Procedures:WEAR SUITABLE PROTECTIVE CLOTHING. CAREFULLY SWEEP UP AND REMOVE.
Neutralizing Agent:NONE SPECIFIED BY MANUFACTURER.

=====
===== Handling and Storage =====

Handling and Storage Precautions:KEEP CONTAINER TIGHTLY CLOSED. SUITABLE FOR ANY GENERAL CHEMICAL STORAGE AREA. STORE IN LIGHT-RESISTANT CONTAINERS.
Other Precautions:MATERIAL IS HYGROSCOPIC. AVOID CONTACT WITH EYES, SKIN, CLOTHING. AVOID BREATHING DUST. USE WITH ADEQUATE VENTILATION. CAUSES IRRITATION. MAY BE HARMFUL IF INGESTED/INHALED.

=====
===== Exposure Controls/Personal Protection =====

Respiratory Protection:NONE REQ WHERE ADEQ VENT CONDITIONS EXIST. IF AIRBORNE CONC EXCEEDS TLV, A NIOSH/MSHA APPRVD DUST/MIST RESP IS RECOMMENDED. IF CONC EXCEEDS CAPACITY OF RESP, A NIOSH/MSHA APPRVD SCBA IS ADVISED.
Ventilation:USE GENERAL OR LOCAL EXHAUST VENTILATION TO MEET TLV REQUIREMENTS.
Protective Gloves:PROPER GLOVES ARE REQUIRED.
Eye Protection:CHEMICAL WORKERS GOGGLES .
Other Protective Equipment:LAB COAT.
Work Hygienic Practices:WASH THOROUGHLY AFTER HANDLING.
Supplemental Safety and Health
NONE SPECIFIED BY MANUFACTURER.

=====
===== Physical/Chemical Properties =====

HCC:N1
Spec Gravity:3.10 (H*20=1)
Solubility in Water:APPRECIABLE (>10%)
Appearance and Odor:WHITE TO GRAY SOLID. ODORLESS.
Percent Volatiles by Volume:0

=====
===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES
MINERAL ACIDS.
Stability Condition to Avoid:MOISTURE, LIGHT.

Hazardous Decomposition Products:OXIDES OF SULFUR.

===== Disposal Considerations =====

Waste Disposal Methods:DISPOSE IN ACCORDANCE WITH ALL APPLICABLE
FEDERAL, STATE AND LOCAL ENVIRONMENTAL REGULATIONS.

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particular situation.

FISHER SCIENTIFIC CO CHEMICAL DIV. -- IRON(II)SULFATE, FERROUS SULFATE
HEPTAHYDRAT -- 6810-00-262-8573

=====
Product Identification
=====

Product ID: IRON(II)SULFATE, FERROUS SULFATE HEPTAHYDRAT
MSDS Date: 10/03/1989
FSC: 6810
NIIN: 00-262-8573
MSDS Number: BJKM
=== Responsible Party ===
Company Name: FISHER SCIENTIFIC CO CHEMICAL DIV.
Address: 1 REAGENT LANE
City: FAIR LAWN
State: NJ
ZIP: 07410
Country: US
Info Phone Num: 201-796-7100
Emergency Phone Num: 201-796-7100 OR 201-796-7523
CAGE: 1B464

=====
Contractor Identification
=====

Company Name: FISHER SCIENTIFIC CO. CHEMICAL MFG DIV
Address: 1 REAGENT LANE
Box: City: FAIRLAWN
State: NJ
ZIP: 07410-2802
Country: US
Phone: 201-796-7100
CAGE: 1B464

=====
Composition/Information on Ingredients
=====

Ingred Name: FERROUS SULFATE (SARA III)
CAS: 7782-63-0
RTECS #: NO8510000
Fraction by Wt: 100%
Other REC Limits: NONE SPECIFIED
OSHA PEL: 1 MG FE/M3
ACGIH TLV: 1 MG FE/M3; 9192
EPA Rpt Qty: 1000 LBS
DOT Rpt Qty: 1000 LBS

=====
Hazards Identification
=====

LD50 LC50 Mixture: LD50 (ORAL RAT) IS 1389 MG/KG
Routes of Entry: Inhalation: YES Skin: YES Ingestion: YES
Reports of Carcinogenicity: NTP: NO IARC: NO OSHA: NO
Health Hazards Acute and Chronic: SEVERE EYE, SKIN, AND MUCOUS MEMBRANE
IRRITANT. POISONING MAY AFFECT THE DIGESTIVE TRACT, RESPIRATORY,
CARDIOVASCULAR AND CNS, LIVER, AND KIDNEYS. INHALATION: DUST/MIST
CAN CAUSE SEVERE BURNING OF RES PIRATORY TRACT. INGESTION: SEVERE
PROBLEMS INCLUDING ABDOMINAL PAIN, RETCHING, DIARRHEA, DEHYDRATION,
SHOCK.
Explanation of Carcinogenicity: NONE OF THE CHEMICALS IN THIS PRODUCT IS
LISTED BY IARC, NTP OR OSHA AS A CARCINOGEN.
Effects of Overexposure: EYE AND SKIN BURNS DEVELOP IMMEDIATELY.
INGESTION MAY CAUSE ABDOMINAL PAIN, NAUSEA, VOMITING, HEMORRHAGING,

AND PERFORATION OF ORGANS. INHALATION OF DUST/MIST MAY CAUSE SEVERE RESPIRATORY TRACT IRRITATION, SORE THROAT, COUGH, DYSPNEA. Medical Cond Aggravated by Exposure: PERSONS WITH A HISTORY OF EYE, SKIN AND RESPIRATORY DISORDERS MAY BE AT INCREASED RISK FROM EXPOSURE.

=====
===== First Aid Measures =====

First Aid: EYE: IMMEDIATELY FLUSH WITH PLENTY OF WATER FOR 15-20 MINUTES. GET MEDICAL ATTENTION. SKIN: REMOVE CONTAMINATED CLOTHING. WASH WITH SOAP AND WATER. INHALATION: REMOVE TO FRESH AIR. GIVE OXYGEN IF BREATHING IS DIFFICULT. GIVE ARTIFICIAL RESPIRATION IF VICTIM IS NOT BREATHING. INGESTION: INDUCE VOMITING WITH IPECAC SYRUP. FOLLOW WITH GASTRIC LAVAGE (DEFEROXAMINE & SODIUM BICARBONATE) UNDER MD. ADVICE

=====
===== Fire Fighting Measures =====

Extinguishing Media: USE WATER FOG, CARBON DIOXIDE, FOAM, OR DRY CHEMICAL AS APPROPRIATE FOR SURROUNDINGS.
Fire Fighting Procedures: FIRE FIGHTERS SHOULD USE NIOSH APPROVED SCBA & FULL PROTECTIVE EQUIPMENT WHEN FIGHTING CHEMICAL FIRE. USE WATER SPRAY TO COOL NEARBY CONTAINERS EXPOSED TO FIRE.
Unusual Fire/Explosion Hazard: FIRE OR EXCESSIVE HEAT MAY CAUSE PRODUCTION OF HAZARDOUS DECOMPOSITION PRODUCTS INCLUDING TOXIC SULFUR OXIDES.

=====
===== Accidental Release Measures =====

Spill Release Procedures: WEAR PROTECTIVE EQUIPMENT AND VENTILATE AREA AS REQUIRED. ABSORB SMALL SPILL WITH INERT MATERIAL (SAW DUST, SAND, OIL DRY ETC.) PLACE WASTE IN DOT APPROVED CONTAINER FOR DISPOSAL.
Neutralizing Agent: SODA ASH, LIME OR SODIUM BICARBONATE (SMALL SPILLS)

=====
===== Handling and Storage =====

Handling and Storage Precautions: STORE IN A COOL, DRY, WELL VENTILATED AREA AWAY FROM SOURCES OF IGNITION. KEEP CONTAINER CLOSED WHEN NOT IN USE. PROTECT FROM PHYSICAL DAMAGE.
Other Precautions: CORROSIVE MATERIAL - AVOID CONTACT.

=====
===== Exposure Controls/Personal Protection =====

Respiratory Protection: IF VENTILATION DOES NOT MAINTAIN INHALATION EXPOSURES BELOW PEL (TLV), USE NIOSH/MSHA APPROVED RESPIRATOR AS PER CURRENT 29 CFR 1910.134, INSTRUCTIONS/WARNINGS AND NIOSH-RESPIRATOR SELECTION. USE NIOSH APPROVED PARTICULATE FILTERS.
Ventilation: MECHANICAL (GENERAL) VENTILATION IS USUALLY ADEQUATE.
Protective Gloves: ACID RESISTANT GLOVES
Eye Protection: CHEMICAL SPLASH GOGGLES OR FACE SHIELD
Other Protective Equipment: SAFETY SHOWER AND EYE BATH. INDUSTRIAL TYPE WORK CLOTHING AND APRON AS REQUIRED TO AVOID PROLONGED OR REPEATED CONTACT.
Work Hygienic Practices: WASH THOROUGHLY AFTER HANDLING AND BEFORE EATING OR DRINKING. LAUNDRY CONTAMINATED CLOTHING BEFORE REUSE.
Supplemental Safety and Health

CORROSIVE MATERIAL - AVOID CONTACT.

===== Physical/Chemical Properties =====

HCC:N1
Melt/Freeze Pt:M.P/F.P Text:DECOMPOSES
Spec Gravity:1.898
pH:3.7
Solubility in Water:15.65%
Appearance and Odor:ODORLESS, HYGROSCOPIC, BLUE-GREEN, MONOCLINIC CRYSTALS

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid: YES
STRONG OXIDIZING AGENTS, ALKALIES, ARSENIC TRIOXIDE-SODIUM NITRATE
MIXTURE, METHYL ISOCYANOACETATE.
Stability Condition to Avoid: ALKALINE
Hazardous Decomposition Products: TOXIC AND CORROSIVE OXIDES OF SULFUR.

===== Disposal Considerations =====

Waste Disposal Methods: DISPOSE OF IN ACCORDANCE WITH ALL APPLICABLE
FEDERAL, STATE AND LOCAL REGULATIONS. DILUTED AND NEUTRALIZED
MATERIAL CAN PROBABLY BE FLUSHED TO WASTE WATER TREATMENT VIA A
SEWER.

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assume responsibility for the suitability of this information to their
particular situation.

FISHER SCIENTIFIC -- FLORISIL -- 6810-00F000441

=====
Product Identification
=====

Product ID:FLORISIL
MSDS Date:01/01/1987
FSC:6810
NIIN:00F000441
MSDS Number: BBGQJ
=== Responsible Party ===
Company Name:FISHER SCIENTIFIC/FAIR LAWN, NJ 07410
Emergency Phone Num:(201) 796-7100
CAGE:1B464
=== Contractor Identification ===
Company Name:FISHER SCIENTIFIC CO. CHEMICAL MFG DIV
Address:1 REAGENT LANE
Box:City:FAIRLAWN
State:NJ
ZIP:07410-2802
Country:US
Phone:201-796-7100
CAGE:1B464

=====
Composition/Information on Ingredients
=====

Ingred Name:MAGNESIUM SILICATE
CAS:1343-90-4
RTECS #:OM4360000
Fraction by Wt: 100%

=====
Hazards Identification
=====

Effects of Overexposure:REPEATED OR PROLONGED SKIN CONTACT MAY CAUSE
DERMATITIS/IRRITATION/CONJUNCTIVITIS.

=====
First Aid Measures
=====

First Aid:INHALATION: REMOVE TO FRESH AIR. IF BREATHING HAS STOPPED,
GIVE ARTIFICIAL RESP/OXYGEN. SKIN: REMOVE CONTAMINATED
CLOTHING/SHOES. WASH AFFECTED AREA W/SOAP, MILD DETERGENT/WATER.
INGESTION: GIVE 2-4 O F WATER. INDUCE VOMITING. GET MEDICAL
ATTENTION.

=====
Fire Fighting Measures
=====

Flash Point:NON-FLAMMABLE
Extinguishing Media:DRY CHEMICAL, CO2, WATER SPRAY OR FOAM
Fire Fighting Procedures:AVOID BREATHING VAPORS OR DUSTS. SCBA W/A
FULL FACEPIECE.
Unusual Fire/Explosion Hazard:NEGLIGIBLE FIRE/EXPLOSION HAZARD WHEN
EXPOSED TO HEAT OR FLAME.

=====
Accidental Release Measures
=====

Spill Release Procedures:NO SPECIAL PRECAUTIONS INDICATED.

=====
Exposure Controls/Personal Protection
=====

Ventilation:PROVIDE LOCAL EXHAUST VENTILATION TO KEEP BELOW TLV
Protective Gloves:RUBBER
Eye Protection:SAFETY GOGGLES
Other Protective Equipment:AVOID REPEATED OR PROLONGED CONTACT WITH
THIS SUBSTANCE.
Supplemental Safety and Health
MSDS DATE: 20 FEB 85. MOL WT: 806.3

===== Physical/Chemical Properties =====

Spec Gravity:2.5
Solubility in Water:SLIGHTLY
Appearance and Odor:WHITE/HARD/GRANULAR/POWDERED MAGNESIUM SILICATE.

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES

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FISHER SCIENTIFIC, CHEMICAL DIV. -- GELATIN, G8500 -- 6505-01-185-3292

=====
Product Identification
=====

Product ID:GELATIN, G8500
MSDS Date:03/28/1991
FSC:6505
NIIN:01-185-3292
MSDS Number: BPHSP
=== Responsible Party ===
Company Name:FISHER SCIENTIFIC, CHEMICAL DIV.
Address:1 REAGENT LANE
City:FAIRLAWN
State:NJ
ZIP:07410-2802
Country:US
Info Phone Num:201-796-7100
Emergency Phone Num:201-796-7100 (GASTON L. PILLORI)
CAGE:1B464
=== Contractor Identification ===
Company Name:FISHER SCIENTIFIC CO. CHEMICAL MFG DIV
Address:1 REAGENT LANE
Box:City:FAIRLAWN
State:NJ
ZIP:07410-2802
Country:US
Phone:201-796-7100
CAGE:1B464

=====
Composition/Information on Ingredients
=====

Ingred Name:GELATIN
CAS:9000-70-8
RTECS #:LX8580000
Fraction by Wt: 100%
Other REC Limits:NONE RECOMMENDED

=====
Hazards Identification
=====

Routes of Entry: Inhalation:YES Skin:NO Ingestion:NO
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:ACUTE: INHALE-MAY PRODUCE IRRITATION.
EYE-MAY BE MILD IRRITATION FROM DUST. INGESTION-NO KNOWN EFFECTS.
CHRONIC: INHALE-MAY CAUSE MUCOUS MEMBRANE IRRITATION.EYE-MAY CAUSE
IRRITATION. INGEST-NO KNOWN E FFECTS.
Explanation of Carcinogenicity:NONE
Effects of Overexposure:INAHALTION-COUGHING. EYE-REDNESS FROM DUST.
Medical Cond Aggravated by Exposure:NONE SPECIFIED BY MANUFACTURER.

=====
First Aid Measures
=====

First Aid:INHALE-REMOVE TO FRESH AIR, GIVE SUPPORT BREATHING IF NEEDED,
KEEP WARM & AT REST. SKIN-REMOVE CONTAMINATED CLTHG. WASH SKIN WITH
SOAP & WATER FOR AT LEAST 15 MIN. EYE-WASH WITH WATER FOR AT LEAST
15 MIN WHILE LIFTING EYELIDS. INGESTION-NOT APPLICABLE. GELATIN IS
AN ACCEPTED FOOD PRODUCT. FOR ABOVE EXPOSURES, GET MEDICAL
ATTENTION IMMEDIATELY.

=====
Fire Fighting Measures
=====

Extinguishing Media: DRY CHEMICAL, CARBON DIOXIDE, WATER SPRAY OR REGULAR FOAM. FOR LARGE FIRES, USE WATER SPRAY, FOG OR ALCOHOL FOAM.

Fire Fighting Procedures: NO ACUTE HAZARD. MOVE CONTAINER FROM FIRE AREA IF POSSIBLE. AVOID BREATHING VAPORS OR DUSTS; KEEP UPWIND.

Unusual Fire/Explosion Hazard: NEGLIGIBLE FIRE/EXPLOSION HAZARD IN DUST FORM WHEN EXPOSED TO HEAT & FLAME.

=====
Accidental Release Measures
=====

Spill Release Procedures: SWEEP UP AND PLACE IN A SUITABLE CONTAINER (FIBERBOARD) FOR RECLAMATION OR LATER DISPOSAL.

=====
Handling and Storage
=====

Handling and Storage Precautions: NONE SPECIFIED BY MANUFACTURER.

Other Precautions: AVOID REPEATED OR PROLONGED CONTACT WITH THIS SUBSTANCE. DO NOT WEAR CONTACT LENSES WHEN WORKING WITH CHEMICALS.

=====
Exposure Controls/Personal Protection
=====

Respiratory Protection: ANY DUST & MIST RESPIRATOR WITH A FULL FACEPIECE. ANY AIR-PURIFYING FULL FACEPIECE RESPIRATOR WITH A HIGH-EFFICIENCY PARTICULATE FILTER. ANY POWDERED AIR-PURIFYING RESPIRATOR WITH A TIGHT-FITTING FACE PICE.

Ventilation: PROVIDE LOCAL EXHAUST OR GENERAL DILUTION VENTILATION SYSTEM.

Protective Gloves: NOT REQUIRED BUT RECOMMENDED.

Eye Protection: NOT REQUIRED BUT ADVISABLE.

Other Protective Equipment: PROTECTIVE CLOTHING NOT REQUIRED, BUT ADVISABLE.

Work Hygienic Practices: NONE SPECIFIED BY MANUFACTURER.

Supplemental Safety and Health

NONE SPECIFIED BY MANUFACTURER.

=====
Physical/Chemical Properties
=====

HCC: N1

Spec Gravity: 0.68 (H2O=1)

pH: 6±0.5

Solubility in Water: SOLUBLE IN WARM H2O

Appearance and Odor: COLORLESS OR YELLOW, TRANSPARENT, BRITTLE, ODORLESS, TASTELESS, SHEETS, FLAKES, POWDE

=====
Stability and Reactivity Data
=====

Stability Indicator/Materials to Avoid: YES

NO DATA AVAILABLE.

Stability Condition to Avoid: STABLE UNDER NORMAL TEMPERATURES AND PRESSURES.

Hazardous Decomposition Products: THERMAL DECOMPOSITION MAY RELEASE TOXIC AND/OR HAZARDOUS GASES.

=====
Disposal Considerations
=====

Waste Disposal Methods:DISPOSAL MUST BE IN ACCORDANCE WITH FEDERAL,
STATE & LOCAL REGULATIONS.

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assume responsibility for the suitability of this information to their
particular situation.

FISHER SCIENTIFIC CHEMICAL DIV -- GLYCERINE 10440 G31 1 -- 6850-00F053639

=====
Product Identification
=====

Product ID:GLYCERINE 10440 G31 1
MSDS Date:01/11/1995
FSC:6850
NIIN:00F053639
MSDS Number: CFJMR
=== Responsible Party ===
Company Name:FISHER SCIENTIFIC CHEMICAL DIV
Address:1 REAGENT LN
City:FAIR LAWN
State:NJ
ZIP:07410-2802
Country:US
Info Phone Num:201-796-7100/201-796-7523
Emergency Phone Num:201-796-7100/201-796-7523
CAGE:1B464

==== Contractor Identification ====
Company Name:FISHER SCIENTIFIC CO. CHEMICAL MFG DIV
Address:1 REAGENT LANE
Box:City:FAIRLAWN
State:NJ
ZIP:07410-2802
Country:US
Phone:201-796-7100
CAGE:1B464

=====
Composition/Information on Ingredients
=====

Ingred Name:GLYCERINE, 1,2,3,-TRIHIDROXYPROPANE, GLYCEROL, ANHYDROUS
GLYCERINE, GLYCERIN *97-1*
CAS:56-81-5
RTECS #:MA8050000
Fraction by Wt: 100%
ACGIH TLV:10 MG/CUM (VAPOR)

=====
Hazards Identification
=====

LD50 LC50 Mixture:ORAL LD50(RAT): 12,600 MG/KG GLYCERINE
Routes of Entry: Inhalation:YES Skin:NO Ingestion:YES
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:EYES/SKIN: MAY CAUSE IRRITATION.
INGESTION: GASTROINTESTINAL IRRITANT. INHALATION: RESPIRATORY
IRRITANT. MAY CAUSE KIDNEY INJURY.
Explanation of Carcinogenicity:NONE
Effects of Overexposure:IRRITATION, NAUSEA, VOMITING, DIARRHEA,
HEADACHE

=====
First Aid Measures
=====

First Aid:EYES: FLUSH W/PLENTY OF WATER FOR 15 MINS. SKIN: FLUSH
W/PLENTY OF SOAP & WATER FOR 15 MINS. INGESTION: IF CONSCIOUS &
ALERT, GIVE 2-4 CUPFULS OF MILK/WATER. NEVER GIVE ANYTHING BY MOUTH
IF UNCONSCIOUS. INHALATION: REMOVE TO FRESH AIR IMMEDIATELY. GIVE
CPR/OXYGEN IF NECESSARY. TREAT SYMPTOMATICALLY & SUPPORTIVELY.

OBTAIN MEDICAL ATTENTION IN ALL CASES.

=====
===== Fire Fighting Measures =====

Flash Point:379.4F
Lower Limits:1.1
Extinguishing Media:WATER, DRY CHEMICAL, CHEMICAL
FOAM/ALCOHOL-RESISTANT FOAM
Fire Fighting Procedures:WEAR A SELF CONTAINED BREATHING APPARATUS IN
PRESSURE-DEMAND, MSHA/NIOSH APPROVED & FULL PROTECTIVE GEAR. USE
WATER SPRAY TO COOL FIRE-EXPOSED CONTAINERS.
Unusual Fire/Explosion Hazard:AUTOIGNITION TEMP: 752F.

=====
===== Accidental Release Measures =====

Spill Release Procedures:ABSORB W/INERT MATERIAL, DRY SAND/EARTH. THEN
PLACE INTO CHEMICAL WASTE CONTAINER.

=====
===== Handling and Storage =====

Handling and Storage Precautions:STORE IN A COOL, DRY, WELL VENTILATED
AREA AWAY FROM INCOMPATIBLE SUBSTANCES. USE W/ADEQUATE VENTILATION.

=====
===== Exposure Controls/Personal Protection =====

Respiratory Protection:USE A NIOSH APPROVED REPIRATOR WHEN NECESSARY.
Ventilation:GOOD GENERAL VENTILATION SHOULD BE SUFFICIENT TO CONTROL
AIRBORNE LEVELS.
Protective Gloves:REQUIRED
Eye Protection:CHEMICAL GOGGLES, FACE SHIELD
Other Protective Equipment:PROTECTIVE CLOTHING
Work Hygienic Practices:REMOVE/LAUNDER CONTAMINATED CLOTHING BEFORE
REUSE. WASH THOROUGHLY AFTER HANDLING.
Supplemental Safety and Health
INCOMPATIBILITIES CONT'D: PERCHLORIC ACID, LEAD OXIDES.

=====
===== Physical/Chemical Properties =====

Boiling Pt:B.P. Text:554F
Melt/Freeze Pt:M.P/F.P Text:20F
Decomp Temp:Decomp Text:554F
Vapor Pres:0.0025
Vapor Density:3.17
Spec Gravity:1.4746
Solubility in Water:MISCIBLE
Appearance and Odor:CLEAR VISCOUS LIQUID W/BLAND ODOR

=====
===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES
STRONG OXIDIZERS, HYDROGEN PEROXIDE, POTASSIUM PERMANGANATE, CALCIUM
HYPOCHLORITE, NITRIC ACID, SULFURIC ACID (SEE SUPP)
Stability Condition to Avoid:EXCESSIVE HEAT, OTHER IGNITION SOURCES
Hazardous Decomposition Products:CO, CO2

=====
===== Disposal Considerations =====

Waste Disposal Methods:DISPOSE OF IN ACCORDANCE W/LOCAL, STATE &
FEDERAL REGULATIONS.

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particular situation.

Material Safety Data Sheet

Glycine

ACC# 10490

Section 1 - Chemical Product and Company Identification

MSDS Name: Glycine

Catalog Numbers: S80028, S93253, BP381-1, BP381-5, BP381-500, G45-12, G45-212, G4512LC, G46-1, G46-12KG, G46-500, G48-12, G48-200LB, G48-212, G48-500

Synonyms: Aminoacetic acid; Aminoethanoic acid; Gly.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
56-40-6	Glycine	>98	200-272-2

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white crystals.

Caution! May be absorbed through intact skin. May cause eye and skin irritation. May cause respiratory tract irritation.

Target Organs: No data found.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation. Low hazard for usual industrial handling. May be absorbed through the skin.

Ingestion: Ingestion of large amounts may cause gastrointestinal irritation. Low hazard for usual industrial handling.

Inhalation: May cause respiratory tract irritation. Low hazard for usual industrial handling.
Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid if irritation develops or persists. Wash clothing before reuse. Flush skin with plenty of soap and water.

Ingestion: Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Dusts at sufficient concentrations can form explosive mixtures with air. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 1; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container.

Clean up spills immediately, observing precautions in the Protective Equipment section.

Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid breathing dust.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Glycine	none listed	none listed	none listed

OSHA Vacated PELs: Glycine: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Crystals

Appearance: white

Odor: odorless

pH: 4.0 (1.4% sol.)

Vapor Pressure: Negligible.

Vapor Density: Not available.

Evaporation Rate: Negligible.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 232 - 236 deg C

Decomposition Temperature: 232 deg C

Solubility: Soluble.

Specific Gravity/Density: 1.1607 (water=1)

Molecular Formula:C2H5NO2

Molecular Weight:75.07

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Dust generation, excess heat.

Incompatibilities with Other Materials: Strong oxidizing agents.

Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, irritating and toxic fumes and gases, carbon dioxide.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 56-40-6: MB7600000

LD50/LC50:

CAS# 56-40-6:

Oral, mouse: LD50 = 4920 mg/kg;

Oral, rat: LD50 = 7930 mg/kg;

Glycine is a non-essential amino acid for human development. It is the only amino acid with no asymmetric carbon.

Carcinogenicity:

CAS# 56-40-6: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: Major inhibitory neurotransmitter.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 56-40-6 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.
None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 56-40-6 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 22 Do not breathe dust.

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 56-40-6: 0

Canada - DSL/NDSL

CAS# 56-40-6 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of Not controlled..

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Ethylenediaminetetraacetic acid, reagent ACS

ACC# 95404

Section 1 - Chemical Product and Company Identification

MSDS Name: Ethylenediaminetetraacetic acid, reagent ACS

Catalog Numbers: AC409930000, AC409930010, AC409930050

Synonyms: Acetic acid, (ethylenedinitrilo)tetra-; 3,6-Diazaoctanedioic acid, 3,6-bis(carboxymethyl)-; Edetic acid; EDTA; EDTA (chelating agent); EDTA acid; Endrate; N,N'-1,2-Ethanediybis(N-(carboxymethyl)glycine); Ethylenediaminetetraacetic acid; Ethylenediamine

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
60-00-4	Ethylenediaminetetraacetic acid	>99	200-449-4

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: colorless to white crystals.

Warning! Causes respiratory tract irritation. Causes eye and skin irritation. May cause kidney damage. May cause reproductive and fetal effects.

Target Organs: Kidneys, eyes, skin.

Potential Health Effects

Eye: Causes eye irritation. Causes redness and pain.

Skin: Causes skin irritation. Causes redness and pain.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. Ingestion of large amounts can cause hypocalcemic tetany due to formation of calcium complexes. Exposure may cause kidney injury, muscle cramps, bone-marrow depression, and a generalized allergic reaction. Ingestion of large quantities may cause appreciable systemic toxicity involving blood chemistry changes due to chelation properties.

Inhalation: Causes irritation of the mucous membrane and upper respiratory tract.

Chronic: May cause reproductive and fetal effects. Laboratory experiments have resulted in mutagenic effects. Chronic exposure may cause kidney damage.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Dusts at sufficient concentrations can form explosive mixtures with air. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 1; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container.

Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with skin and eyes. Keep container tightly closed. Avoid breathing dust.

Storage: Do not store in direct sunlight. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Ethylenediaminetetraacetic acid	none listed	none listed	none listed

OSHA Vacated PELs: Ethylenediaminetetraacetic acid: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Crystals

Appearance: colorless to white

Odor: odorless

pH: Not available.

Vapor Pressure: Negligible.

Vapor Density: Not available.

Evaporation Rate: Negligible.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 220 deg C

Decomposition Temperature:240 deg C

Solubility: Slightly soluble.

Specific Gravity/Density:0.86 @ 20C

Molecular Formula:C10H16N2O8

Molecular Weight:292.25

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions. Decarboxylates above 150C.

Conditions to Avoid: Dust generation, excess heat.

Incompatibilities with Other Materials: Strong oxidizing agents, strong bases, aluminum, copper, copper alloys, nickel.

Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, irritating and toxic fumes and gases, carbon dioxide.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 60-00-4: AH4025000

LD50/LC50:

CAS# 60-00-4:

Oral, mouse: LD50 = 30 mg/kg;

Carcinogenicity:

CAS# 60-00-4: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: Embryo or Fetus: Stunted fetus, oral-rat TDLo=7632mg/kg. Specific developmental abnormalities: cardiovascular, craniofacial, musculoskeletal, respiratory, and urogenital, oral-rat TDLo=7632mg/kg.

Reproductive Effects: Fertility: Post-implantation mortality, oral-rat TDLo=7632mg/kg.

Mutagenicity: Cytogenetic Analysis: intraperitoneal-mouse 50mmol/L. DNA Inhibition: hamster fibroblast 500ug/L, rabbit kidney 250umol/L. EDTA leads to morphological changes of chromatin & chromosome structure in plant & animal cells. A weak induction of gene mutations has been reported.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: Fish: Channel catfish: LC50 = 129-159 mg/L; 96Hr; UnspecifiedFish: Rainbow trout: LC50 = 340 mg/L; 24Hr; UnspecifiedFish: Bluegill/Sunfish: LC50 = 129-159 mg/L; 96Hr; UnspecifiedFish: Fathead Minnow: 100% Lethal = 750 ppm; 96 Hr; Static bioassay
Water flea Daphnia: LC50 > 100 ppm; 96 Hr; Static bioassay
If released to soil, EDTA is expected to complex with trace metals and alkaline earth metals present in the soil, thereby causing an increase in the total solubility of the metals. EDTA may eventually predominate as the Fe(III) chelate in acidic soils and as the Ca chelate in alkaline soils. Biodegradation of EDTA in aerobic soils is the dominant removal mechanism, although biodegradation in anaerobic soils is negligible. glycine. EDTA is not expected to bioaccumulate in aquatic organisms, adsorb to suspended solids or sediments or volatilize from water surfaces.

Environmental: EDTA and its chelates are expected to leach readily through soil and significant volatilization from soil is not expected. If released to water, EDTA is expected to complex with trace metals and alkaline earth metals. Biodegradation of EDTA is expected to take place relatively slowly under aerobic conditions and to be negligible under anaerobic conditions. Cometabolism has been suggested as the mechanism for EDTA biodegradation. EDTA may react with photochemically generated hydroxyl radicals (half-life 229 days) and it may photodegrade.

Physical: Compounds identified as possible biodegradation products of the ammonium ferric chelate of EDTA are as follows: ethylenediamine triacetic acid (ED3A), iminodiacetic acid (IDA), N,N-ethylenediamine diacetic acid (N,N-EDDA), N,N'-EDDA, ethylenediamine monoacetic acid (EDMA), nitrilotriacetic acid (NTA) and glycine. The following photodegradation products of Fe(III)-EDTA have been identified: carbon monoxide, formaldehyde, ED3A, N,N-EDDA, N,N'-EDDA, IDA, EDMA and glycine.

Other: None.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 60-00-4 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 60-00-4: 5000 lb final RQ; 2270 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313

No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

CAS# 60-00-4 is listed as a Hazardous Substance under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 60-00-4 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XI

Risk Phrases:

R 36/37/38 Irritating to eyes, respiratory system and skin.

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 37/39 Wear suitable gloves and eye/face protection.

WGK (Water Danger/Protection)

CAS# 60-00-4: 2

Canada - DSL/NDSL

CAS# 60-00-4 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Fast garnet gbc base, 97%

ACC# 91505

Section 1 - Chemical Product and Company Identification

MSDS Name: Fast garnet gbc base, 97%

Catalog Numbers: AC153260000, AC153260250, AC153261000

Synonyms: 2-Aminoazotoluene; 4'-Amino-2,3'-dimethylazobenzene; C.I. 11160; Solvent Yellow 3

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
97-56-3	O-Aminoazotoluene	97	202-591-2

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: red-brown crystalline powder.

Caution! May cause allergic skin reaction. May cause eye and skin irritation. May cause respiratory and digestive tract irritation. Potential cancer hazard. This product contains o-Aminoazotoluene, a chemical known to the state of California to cause cancer.

Target Organs: Skin.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation. May cause sensitization by skin contact.

Ingestion: May cause irritation of the digestive tract. The toxicological properties of this substance have not been fully investigated.

Inhalation: May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated.

Chronic: Potential cancer hazard.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use agent most appropriate to extinguish fire. Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Sweep up, then place into a suitable container for disposal. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid

contact with eyes, skin, and clothing. Avoid ingestion and inhalation.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
O-Aminoazotoluene	none listed	none listed	none listed

OSHA Vacated PELs: O-Aminoazotoluene: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Crystalline powder

Appearance: red-brown

Odor: none reported

pH: Not available.

Vapor Pressure: Negligible.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 101.00 - 102.00 deg C

Decomposition Temperature: Not available.

Solubility: 7.64 mg/L @ 25°C

Specific Gravity/Density: Not available.

Molecular Formula: C₁₄H₁₅N₃

Molecular Weight: 225.29

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, strong oxidants.

Incompatibilities with Other Materials: Oxidizing agents.

Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, carbon monoxide, carbon dioxide.

Hazardous Polymerization: Has not been reported

Section 11 - Toxicological Information

RTECS#:

CAS# 97-56-3: XU8800000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 97-56-3:

- **ACGIH:** Not listed.
- **California:** carcinogen, initial date 7/1/87
- **NTP:** Suspect carcinogen
- **IARC:** Group 2B carcinogen

Epidemiology: IARC Group 2B: No data available on human carcinogenicity, however sufficient evidence of carcinogenicity in animals.

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: Mutagenic effects have occurred in experimental animals.

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: This substance has low mobility in soil and is not expected to volatilize from moist soil surfaces. May bioconcentrate in aquatic organisms and may adsorb to suspended solids and sediment in the water. May react rapidly with hydroxyl radicals in the atmosphere.

Physical: No information available.

Other: No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 97-56-3 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

Section 313

This material contains O-Aminoazotoluene (CAS# 97-56-3, 97%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 97-56-3 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

California Prop 65

The following statement(s) is(are) made in order to comply with the California Safe Drinking Water Act:

WARNING: This product contains O-Aminoazotoluene, a chemical known to the state of California to cause cancer.

California No Significant Risk Level: CAS# 97-56-3: 0.2 æg/day NSRL

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

T

Risk Phrases:

R 43 May cause sensitization by skin contact.

R 45 May cause cancer.

Safety Phrases:

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 53 Avoid exposure - obtain special instructions before use.

WGK (Water Danger/Protection)

CAS# 97-56-3: No information available.

Canada - DSL/NDSL

CAS# 97-56-3 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2A.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 97-56-3 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Fast Green FCF, High Purity Biological Stain

ACC# 95265

Section 1 - Chemical Product and Company Identification

MSDS Name: Fast Green FCF, High Purity Biological Stain

Catalog Numbers: AC229740000, AC229740250

Synonyms: Food Green 3; Aizen Food Green No. 3; C.I. 42053; FD and C Green No. 3; Solid Green FCF; 1724 Green

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
2353-45-9	Fast Green FCF	ca 100	219-091-5

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: green solid.

Caution! May cause eye, skin, and respiratory tract irritation. The toxicological properties of this material have not been fully investigated.

Target Organs: No data found.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. The toxicological properties of this substance have not been fully investigated.

Inhalation: Dust is irritating to the respiratory tract. May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use extinguishing media most appropriate for the surrounding fire. Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before

reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Fast Green FCF	none listed	none listed	none listed

OSHA Vacated PELs: Fast Green FCF: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: green

Odor: odorless

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: Decomposes.

Decomposition Temperature: 290 deg C

Solubility: Not available.

Specific Gravity/Density: Not available.

Molecular Formula:C37H36N2O10S3.2Na

Molecular Weight:810.419

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, dust generation, excess heat.

Incompatibilities with Other Materials: Oxidizing agents.

Hazardous Decomposition Products: Carbon monoxide, oxides of nitrogen, irritating and toxic fumes and gases, carbon dioxide, sulfur oxides (SOx), including sulfur oxide and sulfur dioxide.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 2353-45-9: BQ4425000

LD50/LC50:

CAS# 2353-45-9:

Oral, rat: LD50 = >2 gm/kg;

Carcinogenicity:

CAS# 2353-45-9: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: IARC Group 3: Suspected animal carcinogenic substance of potential relevance to humans. IARC Group 3: Limited or insufficient evidence for carcinogenicity in both animals and humans.

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 2353-45-9 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 2353-45-9: delayed.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 2353-45-9 can be found on the following state right to know lists: California.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XN

Risk Phrases:

R 20/21/22 Harmful by inhalation, in contact with skin and if swallowed.

R 40 Limited evidence of a carcinogenic effect.

Safety Phrases:

S 25 Avoid contact with eyes.

S 37 Wear suitable gloves.

S 37/39 Wear suitable gloves and eye/face protection.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 28A After contact with skin, wash immediately with plenty of water

WGK (Water Danger/Protection)

CAS# 2353-45-9: No information available.

Canada - DSL/NDSL

CAS# 2353-45-9 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2A.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Ferric Sulfate Monohydrate

ACC# 45419

Section 1 - Chemical Product and Company Identification

MSDS Name: Ferric Sulfate Monohydrate

Catalog Numbers: S80013, S93243

Synonyms: Diiron Trisulfate; Ferric Sulfate; Iron Persulfate; Iron Sesquisulfate; Iron Sulfate (2:3); Iron (3+) Sulfate; Sulfuric Acid, Iron

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
10028-22-5	Ferric sulfate, monohydrate	100	233-072-9

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: yellow-gray solid.

Caution! May cause respiratory tract irritation. Causes severe digestive tract irritation with pain, nausea, vomiting and diarrhea. May corrode the digestive tract with hemorrhaging and possible shock. May cause liver and kidney damage.

Target Organs: None.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation.

Ingestion: May cause severe gastrointestinal tract irritation with nausea, vomiting and possible burns. May cause liver and kidney damage.

Inhalation: May cause respiratory tract irritation.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Get medical aid if irritation develops or persists. Flush skin with plenty of soap and water.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation: Get medical aid immediately. Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media: Use alcohol foam, carbon dioxide, or water spray when fighting fires involving this material.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: ; Flammability: ; Instability:

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up or absorb material, then place into a suitable clean, dry, closed container for disposal.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before

reuse. Use with adequate ventilation. Discard contaminated shoes.
Storage: Store in a cool, dry place. Keep containers tightly closed.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate ventilation to keep airborne concentrations low.
Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Ferric sulfate, monohydrate	1 mg/m ³ TWA (as Fe) (listed under Iron salts (soluble)).	1 mg/m ³ TWA (as Fe) (listed under Iron salts (soluble)).	none listed

OSHA Vacated PELs: Ferric sulfate, monohydrate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: yellow-gray

Odor: odorless

pH: Not available.

Vapor Pressure: Negligible.

Vapor Density: Not available.

Evaporation Rate: Negligible.

Viscosity: Not available.

Boiling Point: Not applicable.

Freezing/Melting Point: Decomposes.

Decomposition Temperature: 480 deg C

Solubility: Soluble in water.

Specific Gravity/Density: 3.097

Molecular Formula: Fe₂(SO₄)₃.H₂O

Molecular Weight: 399.8668

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials.

Incompatibilities with Other Materials: Corrosive to metals.

Hazardous Decomposition Products: Sulfur oxides (SO_x), including sulfur oxide and sulfur dioxide.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 10028-22-5: NO8505000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 10028-22-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No data available.

Teratogenicity: No data available.

Reproductive Effects: No data available.

Mutagenicity: No data available.

Neurotoxicity: No data available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	CORROSIVE SOLID, ACIDIC, INORGANIC, N.O.S.	No information available.
Hazard Class:	8	
UN Number:	UN3260	
Packing Group:	II	

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 10028-22-5 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 10028-22-5: 1000 lb final RQ; 454 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

CAS# 10028-22-5 is listed as a Hazardous Substance under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 10028-22-5 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, (listed as Iron salts (soluble)), Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XN

Risk Phrases:

R 22 Harmful if swallowed.

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

WGK (Water Danger/Protection)

CAS# 10028-22-5: 1

Canada - DSL/NDSL

CAS# 10028-22-5 is listed on Canada's DSL List.

Canada - WHMIS

WHMIS: Not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 10028-22-5 (listed as Iron salts (soluble)) is listed on the Canadian Ingredient Disclosure List.

FISHER SCIENTIFIC CO CHEMICAL DIV. -- IRON(II)SULFATE, FERROUS SULFATE
HEPTAHYDRAT -- 6810-00-262-8573

=====
Product Identification
=====

Product ID: IRON(II)SULFATE, FERROUS SULFATE HEPTAHYDRAT
MSDS Date: 10/03/1989
FSC: 6810
NIIN: 00-262-8573
MSDS Number: BJKPM
=== Responsible Party ===
Company Name: FISHER SCIENTIFIC CO CHEMICAL DIV.
Address: 1 REAGENT LANE
City: FAIR LAWN
State: NJ
ZIP: 07410
Country: US
Info Phone Num: 201-796-7100
Emergency Phone Num: 201-796-7100 OR 201-796-7523
CAGE: 1B464

==== Contractor Identification ====

Company Name: FISHER SCIENTIFIC CO. CHEMICAL MFG DIV
Address: 1 REAGENT LANE
Box: City: FAIRLAWN
State: NJ
ZIP: 07410-2802
Country: US
Phone: 201-796-7100
CAGE: 1B464

=====
Composition/Information on Ingredients
=====

Ingred Name: FERROUS SULFATE (SARA III)
CAS: 7782-63-0
RTECS #: NO8510000
Fraction by Wt: 100%
Other REC Limits: NONE SPECIFIED
OSHA PEL: 1 MG FE/M3
ACGIH TLV: 1 MG FE/M3; 9192
EPA Rpt Qty: 1000 LBS
DOT Rpt Qty: 1000 LBS

=====
Hazards Identification
=====

LD50 LC50 Mixture: LD50 (ORAL RAT) IS 1389 MG/KG
Routes of Entry: Inhalation: YES Skin: YES Ingestion: YES
Reports of Carcinogenicity: NTP: NO IARC: NO OSHA: NO
Health Hazards Acute and Chronic: SEVERE EYE, SKIN, AND MUCOUS MEMBRANE
IRRITANT. POISONING MAY AFFECT THE DIGESTIVE TRACT, RESPIRATORY,
CARDIOVASCULAR AND CNS, LIVER, AND KIDNEYS. INHALATION: DUST/MIST
CAN CAUSE SEVERE BURNING OF RES PIRATORY TRACT. INGESTION: SEVERE
PROBLEMS INCLUDING ABDOMINAL PAIN, RETCHING, DIARRHEA, DEHYDRATION,
SHOCK.
Explanation of Carcinogenicity: NONE OF THE CHEMICALS IN THIS PRODUCT IS
LISTED BY IARC, NTP OR OSHA AS A CARCINOGEN.
Effects of Overexposure: EYE AND SKIN BURNS DEVELOP IMMEDIATELY.
INGESTION MAY CAUSE ABDOMINAL PAIN, NAUSEA, VOMITING, HEMORRHAGING,

AND PERFORATION OF ORGANS. INHALATION OF DUST/MIST MAY CAUSE SEVERE RESPIRATORY TRACT IRRITATION, SORE THROAT, COUGH, DYSPNEA. Medical Cond Aggravated by Exposure: PERSONS WITH A HISTORY OF EYE, SKIN AND RESPIRATORY DISORDERS MAY BE AT INCREASED RISK FROM EXPOSURE.

===== First Aid Measures =====

First Aid: EYE: IMMEDIATELY FLUSH WITH PLENTY OF WATER FOR 15-20 MINUTES. GET MEDICAL ATTENTION. SKIN: REMOVE CONTAMINATED CLOTHING. WASH WITH SOAP AND WATER. INHALATION: REMOVE TO FRESH AIR. GIVE OXYGEN IF BREATHING IS DIFFICULT. GIVE ARTIFICIAL RESPIRATION IF VICTIM IS NOT BREATHING. INGESTION: INDUCE VOMITING WITH IPECAC SYRUP. FOLLOW WITH GASTRIC LAVAGE (DEFEROXAMINE & SODIUM BICARBONATE) UNDER MD. ADVICE

===== Fire Fighting Measures =====

Extinguishing Media: USE WATER FOG, CARBON DIOXIDE, FOAM, OR DRY CHEMICAL AS APPROPRIATE FOR SURROUNDINGS.
Fire Fighting Procedures: FIRE FIGHTERS SHOULD USE NIOSH APPROVED SCBA & FULL PROTECTIVE EQUIPMENT WHEN FIGHTING CHEMICAL FIRE. USE WATER SPRAY TO COOL NEARBY CONTAINERS EXPOSED TO FIRE.
Unusual Fire/Explosion Hazard: FIRE OR EXCESSIVE HEAT MAY CAUSE PRODUCTION OF HAZARDOUS DECOMPOSITION PRODUCTS INCLUDING TOXIC SULFUR OXIDES.

===== Accidental Release Measures =====

Spill Release Procedures: WEAR PROTECTIVE EQUIPMENT AND VENTILATE AREA AS REQUIRED. ABSORB SMALL SPILL WITH INERT MATERIAL (SAW DUST, SAND, OIL DRY ETC.) PLACE WASTE IN DOT APPROVED CONTAINER FOR DISPOSAL.
Neutralizing Agent: SODA ASH, LIME OR SODIUM BICARBONATE (SMALL SPILLS)

===== Handling and Storage =====

Handling and Storage Precautions: STORE IN A COOL, DRY, WELL VENTILATED AREA AWAY FROM SOURCES OF IGNITION. KEEP CONTAINER CLOSED WHEN NOT IN USE. PROTECT FROM PHYSICAL DAMAGE.
Other Precautions: CORROSIVE MATERIAL - AVOID CONTACT.

===== Exposure Controls/Personal Protection =====

Respiratory Protection: IF VENTILATION DOES NOT MAINTAIN INHALATION EXPOSURES BELOW PEL (TLV), USE NIOSH/MSHA APPROVED RESPIRATOR AS PER CURRENT 29 CFR 1910.134, INSTRUCTIONS/WARNINGS AND NIOSH-RESPIRATOR SELECTION. USE NIOSH APPROVED PARTICULATE FILTERS.
Ventilation: MECHANICAL (GENERAL) VENTILATION IS USUALLY ADEQUATE.
Protective Gloves: ACID RESISTANT GLOVES
Eye Protection: CHEMICAL SPLASH GOGGLES OR FACE SHIELD
Other Protective Equipment: SAFETY SHOWER AND EYE BATH. INDUSTRIAL TYPE WORK CLOTHING AND APRON AS REQUIRED TO AVOID PROLONGED OR REPEATED CONTACT.
Work Hygienic Practices: WASH THOROUGHLY AFTER HANDLING AND BEFORE EATING OR DRINKING. LAUNDRY CONTAMINATED CLOTHING BEFORE REUSE.
Supplemental Safety and Health

CORROSIVE MATERIAL - AVOID CONTACT.

===== Physical/Chemical Properties =====

HCC:N1
Melt/Freeze Pt:M.P/F.P Text:DECOMPOSES
Spec Gravity:1.898
pH:3.7
Solubility in Water:15.65%
Appearance and Odor:ODORLESS, HYGROSCOPIC, BLUE-GREEN, MONOCLINIC CRYSTALS

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES
STRONG OXIDIZING AGENTS, ALKALIES, ARSENIC TRIOXIDE-SODIUM NITRATE
MIXTURE, METHYL ISOCYANOACETATE.
Stability Condition to Avoid:ALKALINE
Hazardous Decomposition Products:TOXIC AND CORROSIVE OXIDES OF SULFUR.

===== Disposal Considerations =====

Waste Disposal Methods:DISPOSE OF IN ACCORDANCE WITH ALL APPLICABLE
FEDERAL, STATE AND LOCAL REGULATIONS. DILUTED AND NEUTRALIZED
MATERIAL CAN PROBABLY BE FLUSHED TO WASTE WATER TREATMENT VIA A
SEWER.

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assume responsibility for the suitability of this information to their
particular situation.

Material Safety Data Sheet

Florisil

ACC# 91725

Section 1 - Chemical Product and Company Identification

MSDS Name: Florisil

Catalog Numbers: 1113113, 1113114, 1113115, 1113116

Synonyms: None Known.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
1343-88-0	Magnesium Silicate Hydrate	ca. 100	215-681-1

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid.

Caution! May cause eye and skin irritation. May cause respiratory and digestive tract irritation. The toxicological properties of this material have not been fully investigated.

Target Organs: No data found.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation.

Ingestion: May cause irritation of the digestive tract.

Inhalation: May cause respiratory tract irritation.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Non-combustible, substance itself does not burn but may decompose upon heating to produce irritating, corrosive and/or toxic fumes. Runoff from fire control or dilution water may cause pollution.

Extinguishing Media: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire. Use agent most appropriate to extinguish fire.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use process enclosure, local exhaust ventilation, or other engineering controls to control airborne levels.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Magnesium Silicate Hydrate	none listed	none listed	none listed

OSHA Vacated PELs: Magnesium Silicate Hydrate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white

Odor: odorless

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point:Not available.
Decomposition Temperature:Not available.
Solubility: Not available.
Specific Gravity/Density:2.510
Molecular Formula:Not applicable.
Molecular Weight:Not available.

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Incompatible materials, dust generation, excess heat, strong oxidants.
Incompatibilities with Other Materials: Oxidizing agents.
Hazardous Decomposition Products: Carbon monoxide, carbon monoxide, carbon dioxide, oxides of manganese, oxides of silicon.
Hazardous Polymerization: Has not been reported

Section 11 - Toxicological Information

RTECS#:
CAS# 1343-88-0 unlisted.
LD50/LC50:
Not available.

Carcinogenicity:
CAS# 1343-88-0: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found
Teratogenicity: No information found
Reproductive Effects: No information found
Mutagenicity: No information found
Neurotoxicity: No information found
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 1343-88-0 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.
None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 1343-88-0 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 1343-88-0: 0

Canada - DSL/NDSL

CAS# 1343-88-0 is listed on Canada's DSL List.

Canada - WHMIS

WHMIS: Not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

D-Galactose, 98% (HPLC)

ACC# 00654

Section 1 - Chemical Product and Company Identification

MSDS Name: D-Galactose, 98% (HPLC)

Catalog Numbers: AC410840000, AC410841000, AC410845000

Synonyms: D-Galactopyranose

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
59-23-4	D-Galactose	ca. 100%	200-416-4

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white.

Caution! May cause eye and skin irritation. May cause respiratory and digestive tract irritation. This substance has caused adverse reproductive and fetal effects in animals. This is expected to be a low hazard for usual industrial handling.

Target Organs: None.

Potential Health Effects

Eye: May cause eye irritation. Dust may cause mechanical irritation.

Skin: May cause skin irritation. Low hazard for usual industrial handling.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. Low hazard for usual industrial handling.

Inhalation: May cause respiratory tract irritation. Low hazard for usual industrial handling.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. If irritation develops, get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists. Wash clothing before reuse.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Dusts at sufficient concentrations can form explosive mixtures with air. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Vapors may be heavier than air. They can spread along the ground and collect in low or confined areas.

Extinguishing Media: Use agent most appropriate to extinguish fire. Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Store in a tightly closed container. Keep from contact with oxidizing materials. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate ventilation to keep airborne concentrations low.
Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
D-Galactose	none listed	none listed	none listed

OSHA Vacated PELs: D-Galactose: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white

Odor: odorless

pH: Not available.

Vapor Pressure: Negligible.

Vapor Density: 6.2

Evaporation Rate: Negligible.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 167 deg C

Decomposition Temperature: Not available.

Solubility: 680 g/l (25 C) in water.

Specific Gravity/Density: Not available.

Molecular Formula:C6H12O6

Molecular Weight:180.0804

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, dust generation, excess heat.

Incompatibilities with Other Materials: Oxidizing agents.

Hazardous Decomposition Products: Carbon monoxide, carbon monoxide, carbon dioxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 59-23-4: LW5490000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 59-23-4: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: Effects on Newborn: Germ cell effects, oral-rat TDLo=1000g/kg; Growth Statistics, oral-rat TDLo=440g/kg; Live birth index, oral-mouse TDLo=165g/kg. Embryo or fetus, oral-rat TDLo=240g/kg.

Reproductive Effects: Fertility: Abortion, oral-mouse TDLo=1260g/kg.

Mutagenicity: No information available.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a

hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 59-23-4 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 59-23-4 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

Not available.

Risk Phrases:**Safety Phrases:**

S 24/25 Avoid contact with skin and eyes.

S 37 Wear suitable gloves.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 28A After contact with skin, wash immediately with plenty of water

WGK (Water Danger/Protection)

CAS# 59-23-4: 0

Canada - DSL/NDSL

CAS# 59-23-4 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2A.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Gelatin

ACC# 10345

Section 1 - Chemical Product and Company Identification

MSDS Name: Gelatin

Catalog Numbers: AC611995000, G7-3, G7-500, G8-500

Synonyms: Absorbable Gelatin Sponge; Gelatine; Pharmagel.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
9000-70-8	GELATIN	100	232-554-6

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white to pale yellow solid.

Caution! May cause eye, skin, and respiratory tract irritation. This is expected to be a low hazard for usual industrial handling.

Target Organs: No data found.

Potential Health Effects

Eye: Dust may cause mechanical irritation.

Skin: Dust may cause mechanical irritation. Intraperitoneal injection has resulted in fetal effects.

Ingestion: Low hazard for usual industrial handling.

Inhalation: May cause respiratory tract irritation.

Chronic: Intraperitoneal injection has resulted in fetal effects.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Combustion generates toxic fumes.

Extinguishing Media: Use water spray, dry chemical, or carbon dioxide.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container.

Clean up spills immediately, observing precautions in the Protective Equipment section.

Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with skin and eyes. Avoid ingestion and

inhalation.

Storage: Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
GELATIN	none listed	none listed	none listed

OSHA Vacated PELs: GELATIN: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white to pale yellow

Odor: none reported

pH: 6.0 (6% solution)

Vapor Pressure: Negligible.

Vapor Density: Not available.

Evaporation Rate: Negligible.

Viscosity: Not available.

Boiling Point: Not applicable.

Freezing/Melting Point: Not available.

Decomposition Temperature: Not available.

Solubility: Soluble in water.

Specific Gravity/Density: 0.68 (water=1)

Molecular Formula: Varies

Molecular Weight: Not available.

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: High temperatures, incompatible materials, dust generation.

Incompatibilities with Other Materials: Strong oxidizers.

Hazardous Decomposition Products: Carbon monoxide, oxides of nitrogen, carbon dioxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 9000-70-8: LX8580000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 9000-70-8: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: Effects on Newborn: Reduced weight gain, intraperitoneal mouse TDLo=700mg/kg. Specific Developmental Abnormalities: Urogenital; intraperitoneal mouse TDLo=700mg/kg.

Reproductive Effects: No information available.

Mutagenicity: Please refer to RTECS# LX8580000 for specific information.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information reported.

Physical: No information available.

Other: None.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a

hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 9000-70-8 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 9000-70-8 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

Not available.

Risk Phrases:**Safety Phrases:**

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 9000-70-8: 0

Canada - DSL/NDSL

CAS# 9000-70-8 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of Not controlled.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Guar gum

ACC# 89758

Section 1 - Chemical Product and Company Identification

MSDS Name: Guar gum

Catalog Numbers: S76773, S76774

Synonyms: Guaran; Indalca AG; Jaguar.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
9000-30-0	Guar gum	100.0	232-536-8

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: yellowish-white powder.

Caution! Repeated inhalation of dust can cause sensitization to susceptible individuals. May cause allergic skin reaction. May cause eye, skin, and respiratory tract irritation. The toxicological properties of this material have not been fully investigated.

Target Organs: Respiratory system, skin.

Potential Health Effects

Eye: Dust may cause mechanical irritation.

Skin: May cause skin irritation. May cause sensitization by skin contact.

Ingestion: May cause irritation of the digestive tract. The toxicological properties of this substance have not been fully investigated.

Inhalation: The toxicological properties of this substance have not been fully investigated.

Inhalation of dust may cause respiratory tract irritation. May cause respiratory sensitization.
Chronic: Some individuals may develop a respiratory allergenic response to guar dust. Persons with a history of respiratory allergies may have those conditions aggravated by exposure to guar dust.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Runoff from fire control or dilution water may cause pollution.

Extinguishing Media: Use agent most appropriate to extinguish fire.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up or absorb material, then place into a suitable clean, dry, closed container for disposal. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Guar gum	none listed	none listed	none listed

OSHA Vacated PELs: Guar gum: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Powder

Appearance: yellowish-white

Odor: Not available.

pH: 5.5-6.2 (1% solution)

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: Not available.

Decomposition Temperature: Not available.

Solubility: Soluble.

Specific Gravity/Density:Not available.

Molecular Formula:Not available.

Molecular Weight:Not available.

Section 10 - Stability and Reactivity

Chemical Stability: Stable.

Conditions to Avoid: Incompatible materials, dust generation, excess heat.

Incompatibilities with Other Materials: None reported.

Hazardous Decomposition Products: Irritating and toxic fumes and gases, acrid smoke and fumes.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 9000-30-0: MG0185000

LD50/LC50:

CAS# 9000-30-0:

Oral, mouse: LD50 = 8100 mg/kg;

Oral, rabbit: LD50 = 7 gm/kg;

Oral, rat: LD50 = 6770 mg/kg;

Carcinogenicity:

CAS# 9000-30-0: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 9000-30-0 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.
None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 9000-30-0 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

WGK (Water Danger/Protection)

CAS# 9000-30-0: 0

Canada - DSL/NDSL

CAS# 9000-30-0 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

D-Glucose-1-Phosphate Disodium Salt Tetrahydrate

ACC# 08226

Section 1 - Chemical Product and Company Identification

MSDS Name: D-Glucose-1-Phosphate Disodium Salt Tetrahydrate

Catalog Numbers: S74566

Synonyms: 17364-14-6 is for the anhydrous sodium salt (C₆H₁₃O₉P.xNa), not the tetrahydrate. 56401-20-8 is for the anhydrous disodium salt of alpha-d-glucopyranose, 1-(dihydrogen phosphate). 32972-46-6 is also for the anhydrous disodium salt. There is no alpha designation in this name.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
56401-20-8	α-D-Glucopyranose, 1-(dihydrogenphosphate), disodium	100	260-154-1

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: not available solid.

Caution! May cause eye and skin irritation. The toxicological properties of this material have not been fully investigated.

Target Organs: None.

Potential Health Effects

Eye: Dust may cause mechanical irritation.

Skin: May cause skin irritation.

Ingestion: No information found. The toxicological properties of this substance have not been fully investigated.

Inhalation: No information available. The toxicological properties of this substance have not been fully investigated.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: No specific antidote exists. Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. This material in sufficient quantity and reduced particle size is capable of creating a dust explosion.

Extinguishing Media: Use extinguishing media most appropriate for the surrounding fire.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: ; Flammability: 1; Instability:

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Sweep up or absorb material, then place into a suitable clean, dry, closed container for disposal. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with skin and eyes. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Store in a cool, dry place.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
a-D-Glucopyranose, 1-(dihydrogenphosphate), disodium	none listed	none listed	none listed
D-Glucopyranose, 1-(dihydrogen phosphate), sodium salt	none listed	none listed	none listed
d-Glucopyranose, 1-(dihydrogen phosphate), disodium salt	none listed	none listed	none listed

OSHA Vacated PELs: a-D-Glucopyranose, 1-(dihydrogenphosphate), disodium: No OSHA Vacated PELs are listed for this chemical. D-Glucopyranose, 1-(dihydrogen phosphate), sodium salt: No OSHA Vacated PELs are listed for this chemical. d-Glucopyranose, 1-(dihydrogen phosphate), disodium salt: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: not available

Odor: none reported

pH: Not available.

Vapor Pressure: Negligible.
Vapor Density: Not applicable.
Evaporation Rate: Negligible.
Viscosity: Not available.
Boiling Point: Not applicable.
Freezing/Melting Point: Not available.
Decomposition Temperature: Not available.
Solubility: Soluble.
Specific Gravity/Density: Not available.
Molecular Formula: C₆H₁₁O₉PNa₂·4H₂O
Molecular Weight: 304.12

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: High temperatures, dust generation.
Incompatibilities with Other Materials: Strong oxidizing agents.
Hazardous Decomposition Products: No data available.
Hazardous Polymerization: Has not been reported

Section 11 - Toxicological Information

RTECS#:

CAS# 56401-20-8 unlisted.

CAS# 17364-14-6 unlisted.

CAS# 32972-46-6 unlisted.

LD50/LC50:

Not available.

Not available.

Not available.

Carcinogenicity:

CAS# 56401-20-8: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 17364-14-6: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 32972-46-6: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: Please refer to RTECS for specific information.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 56401-20-8 is not listed on the TSCA inventory. It is for research and development use only.

CAS# 17364-14-6 is listed on the TSCA inventory.

CAS# 32972-46-6 is not listed on the TSCA inventory. It is for research and development use only.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 56401-20-8 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

CAS# 17364-14-6 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

CAS# 32972-46-6 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

WGK (Water Danger/Protection)

CAS# 56401-20-8: No information available.

CAS# 17364-14-6: No information available.

CAS# 32972-46-6: No information available.

Canada - DSL/NDSL

CAS# 17364-14-6 is listed on Canada's NDSL List.

Canada - WHMIS

WHMIS: Not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

FISHER SCIENTIFIC CHEMICAL DIV -- BP229 1 GLYCERINE -- 6810-00F051788

=====
Product Identification
=====

Product ID:BP229 1 GLYCERINE
MSDS Date:01/11/1995
FSC:6810
NIIN:00F051788
MSDS Number: CCFTB
=== Responsible Party ===
Company Name:FISHER SCIENTIFIC CHEMICAL DIV
Address:1 REAGENT LN
City:FAIR LAWN
State:NJ
ZIP:07410-2802
Country:US
Info Phone Num:201-796-7100/201-796-7523
Emergency Phone Num:201-796-7100/201-796-7523
CAGE:1B464

==== Contractor Identification ====
Company Name:FISHER SCIENTIFIC CO. CHEMICAL MFG DIV
Address:1 REAGENT LANE
Box:City:FAIRLAWN
State:NJ
ZIP:07410-2802
Country:US
Phone:201-796-7100
CAGE:1B464

=====
Composition/Information on Ingredients
=====

Ingred Name:GLYCERINE, 1,2,3,-TRIHIDROXYPROPANE, GLYCEROL, ANHYDROUS
GLYCERINE, GLYCERIN *96-3*
CAS:56-81-5
RTECS #:MA8050000
Fraction by Wt: 100%
ACGIH TLV:10 MG/CUM (VAPOR)

=====
Hazards Identification
=====

LD50 LC50 Mixture:ORAL LD50 (RAT): 12600 MG/KG
Routes of Entry: Inhalation:YES Skin:NO Ingestion:YES
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:EYES/SKIN: IRRITATION. INGESTION: MAY
CAUSE GASTROINTESTINAL IRRITATION. INHALATION: MAY CAUSE
RESPIRATORY TRACT IRRITATION. MAY CAUSE KIDNEY INJURY.
Explanation of Carcinogenicity:NONE
Effects of Overexposure:IRRITATION, NAUSEA, VOMITING, DIARRHEA.

=====
First Aid Measures
=====

First Aid:EYES: FLUSH W/PLENTY OF WATER FOR 15 MINS. SKIN: FLUSH
W/PLENTY OF SOAP & WATER FOR 15 MINS. INGESTION: IF CONSCIOUS &
ALERT, GIVE 4 CUPS OF MOLK/WATER. NEVER GIVE ANYTHING BY MOUTH TO
AN UNCONSCIOUS PERSON. INHALATION: REMOVE FROM AREA. IF NOT
BREATHING GIVE CPR. IF BREATHING IS DIFFICULT, GIVE OXYGEN. OBTAIN
MEDICAL ATTENTION IN ALL CASES.

=====
===== Fire Fighting Measures =====

Flash Point:379.4F
Lower Limits:1.1
Extinguishing Media:WATER, DRY CHEMICAL, CHEMICAL FOAM/ALCOHOL
RESISTANT FOAM.
Fire Fighting Procedures:WEAR SCBA, PRESSURE-DEMAND, MSHA/NIOSH
APPROVED & FULL PROTECTIVE GEAR.
Unusual Fire/Explosion Hazard:AUTOIGNITION: 752F

=====
===== Accidental Release Measures =====

Spill Release Procedures:ABSORB W/INERT MATERIAL SUCH AS DRY
SAND/EARTH, THEN PLACE INTO A CHEMICAL WASTE CONTAINER.

=====
===== Handling and Storage =====

Handling and Storage Precautions:WASH THOROUGHLY AFTER HANDLING. STORE
IN A COOL, DRY, WELL-VENTILATED AREA AWAY FROM INCOMPATIBLE
SUBSTANCES.

=====
===== Exposure Controls/Personal Protection =====

Respiratory Protection:USE NIOSH APPROVED RESPIRATOR WHEN NECESSARY.
Ventilation:GOOD GENERAL VENTILATION SHOULD BE SUFFICIENT TO CONTROL
AIRBORNE LEVELS.
Protective Gloves:APPROPRIATE
Eye Protection:CHEMICAL GOGGLES & FACESHIELD
Work Hygienic Practices:REMOVE/LAUNDER CONTAMINATED CLOTHING/SHOES
BEFORE REUSE.
Supplemental Safety and Health
MATS TO AVOID: SULFURIC ACID, PERCHLORIC ACID & LEAD OXIDE.

=====
===== Physical/Chemical Properties =====

Boiling Pt:B.P. Text:554F
Melt/Freeze Pt:M.P/F.P Text:20F
Vapor Pres:0.0025
Vapor Density:3.17
Spec Gravity:1.4746
Solubility in Water:MISCIBLE
Appearance and Odor:CLEAR VISCOUS LIQUID W/BLAND ODOR.

=====
===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES
STRONG OXIDIZERS, MIXTURES W/HYDROGEN PEROXIDE, POTASSIUM
PERMANGANATE/CALCIUM HYPOCHLORITE, NITRIC ACID. (SUPP)
Stability Condition to Avoid:IGNITION SOURCES & EXCESS HEAT.
Hazardous Decomposition Products:CO, CO2.

=====
===== Disposal Considerations =====

Waste Disposal Methods:DISPOSE OF IAW/FEDERAL, STATE & LOCAL
REGULATIONS.

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Material Safety Data Sheet

Glycine, 98%

ACC# 96131

Section 1 - Chemical Product and Company Identification

MSDS Name: Glycine, 98%

Catalog Numbers: AC120070000, AC120070010, AC120070050, 12007-2500

Synonyms: Aminoacetic acid; Aminoethanoic acid; Gly.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
56-40-6	Glycine	98	200-272-2

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white crystals.

Caution! May be absorbed through intact skin. May cause eye and skin irritation. May cause respiratory tract irritation.

Target Organs: No data found.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation. Low hazard for usual industrial handling. May be absorbed through the skin.

Ingestion: Ingestion of large amounts may cause gastrointestinal irritation. Low hazard for usual industrial handling.

Inhalation: May cause respiratory tract irritation. Low hazard for usual industrial handling.
Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid if irritation develops or persists. Wash clothing before reuse. Flush skin with plenty of soap and water.

Ingestion: Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Dusts at sufficient concentrations can form explosive mixtures with air. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 1; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container.

Clean up spills immediately, observing precautions in the Protective Equipment section.

Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid breathing dust.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Glycine	none listed	none listed	none listed

OSHA Vacated PELs: Glycine: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Crystals

Appearance: white

Odor: odorless

pH: 4.0 (1.4% sol.)

Vapor Pressure: Negligible.

Vapor Density: Not available.

Evaporation Rate: Negligible.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 232-236 deg C (dec)

Decomposition Temperature: 232 deg C

Solubility: Soluble.

Specific Gravity/Density: 1.1607 (water=1)

Molecular Formula:C2H5NO2

Molecular Weight:75.06

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Dust generation, excess heat.

Incompatibilities with Other Materials: Strong oxidizing agents.

Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, irritating and toxic fumes and gases, carbon dioxide.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 56-40-6: MB7600000

LD50/LC50:

CAS# 56-40-6:

Oral, mouse: LD50 = 4920 mg/kg;

Oral, rat: LD50 = 7930 mg/kg;

Glycine is a non-essential amino acid for human development. It is the only amino acid with no asymmetric carbon.

Carcinogenicity:

CAS# 56-40-6: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: Major inhibitory neurotransmitter.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 56-40-6 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.
None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 56-40-6 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 22 Do not breathe dust.

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 56-40-6: 0

Canada - DSL/NDSL

CAS# 56-40-6 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of Not controlled..

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Hematoxylin, certified

ACC# 60290

Section 1 - Chemical Product and Company Identification

MSDS Name: Hematoxylin, certified

Catalog Numbers: BP2424-100, BP2424-25, BP2523-100, BP2523-25, BP2523-5, H345-100, H345-25

Synonyms: Benz (B) Indol (1,2-D) Pyran-3,4,6A,9,10 (6H)-Pentol,7,11B-Dihydro, Cis-(+)-; Hematoxiline; Hydroxybrazilin; Hydroxybrasilin; Natural Black I.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
517-28-2	Hematoxylin	100	208-237-3

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white to yellow crystals.

Caution! May cause eye, skin, and respiratory tract irritation. Light sensitive. The toxicological properties of this material have not been fully investigated.

Target Organs: None known.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation. May be harmful if absorbed through the skin.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. May be harmful if swallowed.

Inhalation: May cause respiratory tract irritation. May be harmful if inhaled.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Non-combustible, substance itself does not burn but may decompose upon heating to produce irritating, corrosive and/or toxic fumes.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container.

Clean up spills immediately, observing precautions in the Protective Equipment section.

Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation. Use with adequate ventilation. Store protected from light.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Store protected from light.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Hematoxylin	none listed	none listed	none listed

OSHA Vacated PELs: Hematoxylin: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Crystals

Appearance: white to yellow

Odor: Not available.

pH: Not available.

Vapor Pressure: Negligible.

Vapor Density: Not available.

Evaporation Rate: Negligible.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 100 - 120 deg C

Decomposition Temperature: Not available.

Solubility: Soluble in hot water.
Specific Gravity/Density: Not available.
Molecular Formula: C₁₆H₁₄O₆
Molecular Weight: 302.27

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions. Turns reddish-brown on exposure to light.

Conditions to Avoid: Incompatible materials, light, dust generation, excess heat.

Incompatibilities with Other Materials: Strong oxidizing agents.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide, hydrocarbons.

Hazardous Polymerization: Has not been reported

Section 11 - Toxicological Information

RTECS#:

CAS# 517-28-2: MH7875000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 517-28-2: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a

hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not Regulated	Not Regulated
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 517-28-2 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 517-28-2 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

Not available.

Risk Phrases:**Safety Phrases:**

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 517-28-2: 1

Canada - DSL/NDSL

CAS# 517-28-2 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Hemoglobin

ACC# 10161

Section 1 - Chemical Product and Company Identification

MSDS Name: Hemoglobin

Catalog Numbers: AC411200000, AC411202500

Synonyms: Hb; Hemoglobins.

Company Identification:

Acros Organics N.V.

One Reagent Lane

Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
9008-02-0	Hemoglobins	100.0	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: brown crystalline powder.

Caution! This is expected to be a low hazard for usual industrial handling.

Target Organs: None.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation.

Ingestion: May cause irritation of the digestive tract. The toxicological properties of this substance have not been fully investigated.

Inhalation: May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: N/A

Upper: N/A

NFPA Rating: (estimated) Health: ; Flammability: ; Instability:

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up or absorb material, then place into a suitable clean, dry, closed container for disposal. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Keep container closed when not in use. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep refrigerated. (Store below 4°C/39°F.)

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate ventilation to keep airborne concentrations low.
Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Hemoglobins	none listed	none listed	none listed

OSHA Vacated PELs: Hemoglobins: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Crystalline powder

Appearance: brown

Odor: Not available.

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: Not available.

Decomposition Temperature: Not available.

Solubility: Not available.

Specific Gravity/Density: Not available.

Molecular Formula: Not available.

Molecular Weight: Not available.

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Incompatible materials, dust generation, strong oxidants.
Incompatibilities with Other Materials: Oxidizing agents.
Hazardous Decomposition Products: Strong oxidants.
Hazardous Polymerization: Has not been reported

Section 11 - Toxicological Information

RTECS#:
CAS# 9008-02-0: MH8802000
LD50/LC50:
Not available.

Carcinogenicity:
CAS# 9008-02-0: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.
Teratogenicity: No information available.
Reproductive Effects: No information available.
Mutagenicity: No information available.
Neurotoxicity: No information available.
Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.
Environmental: No information found.
Physical: No information found.
Other: No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.
RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 9008-02-0 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 9008-02-0 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

S 37 Wear suitable gloves.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 28A After contact with skin, wash immediately with plenty of water

WGK (Water Danger/Protection)

CAS# 9008-02-0: No information available.

Canada - DSL/NDSL

CAS# 9008-02-0 is listed on Canada's NDSL List.

Canada - WHMIS

WHMIS: Not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Hengar Granules, plain, not selenized

ACC# 89435

Section 1 - Chemical Product and Company Identification

MSDS Name: Hengar Granules, plain, not selenized

Catalog Numbers: S145-500

Synonyms: Aluminum oxide; morin dyed; alumina.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
1344-28-1	Aluminum oxide	100.0	215-691-6

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid.

Caution! May cause respiratory and digestive tract irritation. May cause mechanical eye and skin irritation. May cause lung damage.

Target Organs: None known.

Potential Health Effects

Eye: Dust may cause mechanical irritation.

Skin: Dust may cause mechanical irritation. Low hazard for usual industrial handling.

Ingestion: Ingestion of large amounts may cause gastrointestinal irritation. Expected to be a low ingestion hazard.

Inhalation: May cause respiratory tract irritation. May cause lung damage.

Chronic: Chronic inhalation of fine dusts may cause lung damage.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid if irritation develops or persists. Flush skin with plenty of soap and water.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: Not published.

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate ventilation to keep airborne concentrations low.
Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Aluminum oxide	10 mg/m ³ TWA (particulate matter containing no asbestos and <1% crystalline sili ca)	none listed	15 mg/m ³ TWA (total dust); 5 mg/m ³ TWA (respirable fraction)

OSHA Vacated PELs: Aluminum oxide: 10 mg/m³ TWA (total dust); 5 mg/m³ TWA (respirable fraction)

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white

Odor: Odorless.

pH: Not available.

Vapor Pressure: Negligible.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: 2980 deg C

Freezing/Melting Point: 2000 deg C

Decomposition Temperature: Not available.

Solubility: Negligible in water.

Specific Gravity/Density: 4.0 (water=1)

Molecular Formula: Al₂O₃

Molecular Weight: 101.9612

Section 10 - Stability and Reactivity

Chemical Stability: Stable.

Conditions to Avoid: Incompatible materials, dust generation.

Incompatibilities with Other Materials: Reacts with chlorine trifluoride or ethylene oxide. Exothermic reaction above 200 C with halocarbon vapors produces toxic hydrogen chloride and phosgene.

Hazardous Decomposition Products: Hydrogen chloride, phosgene.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 1344-28-1: BD1200000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 1344-28-1: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: ~ ~Methanol has been shown to produce fetotoxicity in the embryo or fetus in laboratory animals. Specific developmental abnormalities include: musculoskeletal, urogenital and cardiovascular systems,

Teratogenicity: No data available.

Reproductive Effects: No data available.

Mutagenicity: No data available.

Neurotoxicity: No data available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 1344-28-1 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313

This material contains Aluminum oxide (CAS# 1344-28-1, 100.0%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 1344-28-1 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

WGK (Water Danger/Protection)

CAS# 1344-28-1: 0

Canada - DSL/NDSL

CAS# 1344-28-1 is listed on Canada's DSL List.

Canada - WHMIS

not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 1344-28-1 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Hydroquinone

ACC# 11230

Section 1 - Chemical Product and Company Identification

MSDS Name: Hydroquinone

Catalog Numbers: AC120910000, AC120910020, AC120910050, AC120915000, AC219930000, AC219930050, AC219930500, S75134, S80041, H329-500

Synonyms: 1,4-Benzenediol; p-Dihydroxybenzene; Hydroquinol; Quinol; 1,4-Dihydroxybenzene; p-Hydroxyphenol; HQ.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
123-31-9	Hydroquinone	99	204-617-8

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white to off-white solid.

Warning! Eye contact may result in permanent eye damage. Possible risks of irreversible effects. Harmful if swallowed. May cause allergic skin reaction. Causes eye and skin irritation. May cause respiratory tract irritation. May cause methemoglobinemia. Light sensitive. Air sensitive. May cause dermatitis. May cause reproductive and fetal effects.

Target Organs: Central nervous system, eyes, skin.

Potential Health Effects

Eye: May result in corneal injury. May cause conjunctivitis and keratitis. Causes eye irritation and possible burns. May cause redness, pain, blurred vision and possible eye

damage.

Skin: May cause skin sensitization, an allergic reaction, which becomes evident upon re-exposure to this material. May cause dermatitis. Causes redness and pain. May be harmful if absorbed through the skin. Repeated exposure may cause hyperpigmentation of fair skin and depigmentation of dark skin. Causes skin irritation and possible burns. Substance is readily absorbed through the skin.

Ingestion: Harmful if swallowed. May cause severe irritation of the digestive tract. May cause dizziness, nausea, sense of suffocation, increased respiratory rate, vomiting, pallor, muscle twitching, cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood), delirium, collapse. May cause green or brownish green urine which continues to darken upon standing. May cause liver damage leading to jaundice. May cause harmful nervous system effects, including tremors and convulsions.

Inhalation: Causes cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood). May cause respiratory tract irritation. Inhalation may be fatal as a result of spasm, inflammation, edema of the larynx and bronchi, chemical pneumonitis and pulmonary edema. Central nervous system effects may include confusion, ataxia (failure of muscular coordination), vertigo, tinnitus, weakness, disorientation, lethargy, drowsiness, and finally coma. May be harmful if inhaled. May cause burning sensation, coughing, wheezing, laryngitis, shortness of breath, headache, nausea, and vomiting. Pure hydroquinone does not readily form a vapor at room temperature. The dust may cause irritation of the nose, throat and upper respiratory tract. In the presence of air and moisture, hydroquinone dust may react to form irritating quinone which forms a vapor at room temperature. The rate of this reaction depends on the pH of the medium, with alkaline solutions reacting more readily. Therefore, exposures to hydroquinone dust may involve exposure to quinone vapor which is a respiratory irritant. The degree of irritation depends on how much quinone is formed.

Chronic: Prolonged or repeated skin contact may cause sensitization dermatitis and possible destruction and/or ulceration. May cause methemoglobinemia, which is characterized by chocolate-brown colored blood, headache, weakness, dizziness, breath shortness, cyanosis (bluish skin due to deficient oxygenation of blood), rapid heart rate, unconsciousness and possible death. May cause reproductive and fetal effects. Possible risk of irreversible effects.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Dusts at sufficient concentrations can form explosive mixtures with air. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use foam, dry chemical, or carbon dioxide.

Flash Point: 165 deg C (329.00 deg F)

Autoignition Temperature: 550 deg C (1,022.00 deg F)

Explosion Limits, Lower:Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 1; Instability: 1

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up or absorb material, then place into a suitable clean, dry, closed container for disposal. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use only in a well-ventilated area. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation.

Storage: Store in a cool, dry place. Do not store in direct sunlight.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Hydroquinone	2 mg/m ³ TWA	50 mg/m ³ IDLH	2 mg/m ³ TWA

OSHA Vacated PELs: Hydroquinone: 2 mg/m³ TWA

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white to off-white

Odor: odorless

pH: 3.75 (70g/l aq. soln)

Vapor Pressure: 0.00067 mm Hg @ 25 deg C

Vapor Density: 3.8 (air=1)

Evaporation Rate: Negligible.

Viscosity: Not available.

Boiling Point: 285 - 287 deg C @ 760 mmHg

Freezing/Melting Point: 170 - 174 deg C

Decomposition Temperature: Not available.

Solubility: 70 g/l @ 20°C

Specific Gravity/Density: 1.320 g/cm³

Molecular Formula: C₆H₆O₂

Molecular Weight: 110.11

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures. Substance undergoes color change upon exposure to light and air.

Conditions to Avoid: Light, dust generation, moisture.

Incompatibilities with Other Materials: Strong oxidizing agents, strong bases, caustics (e.g. ammonia, ammonium hydroxide, calcium hydroxide, potassium hydroxide, sodium hydroxide), alkalies.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide, phenol.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 123-31-9: MX3500000

LD50/LC50:

CAS# 123-31-9:

Oral, mouse: LD50 = 245 mg/kg;

Oral, mouse: LD50 = 350 mg/kg;

Oral, rabbit: LD50 = 200 mg/kg;

Oral, rat: LD50 = 302 mg/kg;

Oral, rat: LD50 = 320 mg/kg;

Carcinogenicity:

CAS# 123-31-9:

- **ACGIH:** A3 - Confirmed animal carcinogen with unknown relevance to humans
- **California:** Not listed.
- **NTP:** Not listed.
- **IARC:** Not listed.

Epidemiology: Substance may be involved in cancer-forming processes.

Teratogenicity: No information available.

Reproductive Effects: Fertility: Male index, subcutaneous(sct)-rat TDLo=5100 mg/kg; Post-implantation mortality, oral-rat TDLo=2500 mg/kg. Maternal Effects: Menstrual cycle abnormalities, sct-rat TDLo=550mg/kg; Ovaries/fallopian tubes, sct-rat TDLo=5mg/kg. Paternal Effects: Prostate/seminal vesicle/Cowpers gland/urethra and Testes/sperm duct/epididymis, sct-rat TDLo=5100mg/kg.

Mutagenicity: DNA Inhibition: human Hela cell 100umol/L mouse lymphocyte 10umol/L Unscheduled DNA Synthesis: rat oral 8g/kg. Sister Chromatid Exchange: human lymphocyte 5umol/L.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: Fish: Rainbow trout: LC50 = 0.097 mg/L; 96 Hr.; UnspecifiedFish: Fathead Minnow: LC50 = 0.1-0.18 mg/L; 96 Hr.; UnspecifiedBacteria: Phytobacterium phosphoreum: EC50 = 0.77-3.97 mg/L; 5,15,30 minutes; Microtox test No data available.

Environmental: Substance has a high biological oxygen demand, and a high potential to affect aquatic organisms. Substance readily biodegrades, and is not likely to bioconcentrate.

Physical: No information available.

Other: None.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR

Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	HYDROQUINONE	TOXIC SOLIDS, ORGANIC, N.O.S. (HYDROQUINONE)
Hazard Class:	6.1	6.1
UN Number:	UN2662	UN2811
Packing Group:	III	III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 123-31-9 is listed on the TSCA inventory.

Health & Safety Reporting List

CAS# 123-31-9: Effective 10/4/84, Sunset 10/4/94

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 123-31-9: 100 lb final RQ; 45.4 kg final RQ

SARA Section 302 Extremely Hazardous Substances

CAS# 123-31-9: 500 lb lower threshold TPQ; 10000 lb upper threshold TP Q

SARA Codes

CAS # 123-31-9: immediate, delayed.

Section 313

This material contains Hydroquinone (CAS# 123-31-9, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

CAS# 123-31-9 is listed as a hazardous air pollutant (HAP).

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the

CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 123-31-9 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XN N

Risk Phrases:

R 22 Harmful if swallowed.

R 40 Limited evidence of a carcinogenic effect.

R 41 Risk of serious damage to eyes.

R 43 May cause sensitization by skin contact.

R 50 Very toxic to aquatic organisms.

R 68 Possible risk of irreversible effects.

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 36/37/39 Wear suitable protective clothing, gloves and eye/face protection.

S 61 Avoid release to the environment. Refer to special instructions /safety data sheets.

WGK (Water Danger/Protection)

CAS# 123-31-9: 2

Canada - DSL/NDSL

CAS# 123-31-9 is listed on Canada's DSL List.

Canada - WHMIS

not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 123-31-9 is listed on the Canadian Ingredient Disclosure List.

SIGMA CHEMICAL COMPANY -- 23856-2 IGEPAL CA-210 -- 6810-00F056024

=====
Product Identification
=====

Product ID:23856-2 IGEPAL CA-210
MSDS Date:04/01/1995
FSC:6810
NIIN:00F056024
MSDS Number: CGWCQ
=== Responsible Party ===
Company Name:SIGMA CHEMICAL COMPANY
Address:3050 SPRUCE ST
Box:14508
City:SAINT LOUIS
State:MO
ZIP:63178-5000
Country:US
Info Phone Num:314-771-5765/800-325-3010
Emergency Phone Num:314-771-5765/800-325-3010
CAGE:21076

==== Contractor Identification ====

Company Name:ALDRICH CHEMICAL CO INC
Address:1001 WEST ST PAUL AVE
Box:355
City:MILWAUKEE
State:WI
ZIP:53233
Country:US
Phone:414-273-3850
CAGE:60928

Company Name:FLUKA CHEMICAL CORP
Address:1001 WEST ST PAUL
Box:City:MILWAUKEE
State:WI
ZIP:53233
Country:US
Phone:414-273-3850
CAGE:63181

Company Name:SIGMA CHEMICAL COMPANY
Address:3050 SPRUCE ST
Box:14508
City:ST LOUIS
State:MO
ZIP:63178
Country:US
Phone:314-771-5765
CAGE:21076

=====
Composition/Information on Ingredients
=====

Ingred Name:POLY(OXY-1,2-ETHANEDIYL),
ALPHA-(4-OCTYLPHENYL)-OMEGA-HYDROXY- *98-1*
CAS:26636-32-8
RTECS #:MD0878000

=====
Hazards Identification
=====

Routes of Entry: Inhalation:YES Skin:YES Ingestion:YES
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:MAY BE HARMFUL BY INHALATION,
INGESTION/SKIN ABSORPTION. MAY BE IRRITATING TO EYES, MUCOUS
MEMBRANES & UPPER RESPIRATORY TRACT. SKIN: IRRITATION. MAY AFFECT
THE MALE & FEMALE REPRODUCTIVE SYSTEM.
Explanation of Carcinogenicity:NONE
Effects of Overexposure:IRRITATION

=====
===== First Aid Measures =====

First Aid:EYES: IMMEDIATELY FLUSH W/COPIOUS AMOUNTS OF WATER FOR 15
MINS. SKIN: WASH W/SOAP & COPIOUS AMOUNTS OF WATER. INHALATION:
REMOVE TO FRESH AIR. GIVE CPR/OXYGEN IF NECESSARY. INGESTION: WASH
OUT MOUTH W /WATER IF CONSCIOUS. OBTAIN MEDICAL ATTENTION IN ALL
CASES.

=====
===== Fire Fighting Measures =====

Flash Point:>230F
Extinguishing Media:WATER SPRAY, CO2, DRY CHEMICAL POWDER/APPROPRIATE
FOAM
Fire Fighting Procedures:WEAR SELF CONTAINED BREATHING APPARATUS &
PROTECTIVE CLOTHING TO PREVENT CONTACT W/SKIN & EYES. . PREVENT
CONTACT W /SKIN/EYES. COOL CONTAINERS W/WATERSPRAY
Unusual Fire/Explosion Hazard:EMITS TOXIC FUMES UNDER FIRE CONDITIONS.

=====
===== Accidental Release Measures =====

Spill Release Procedures:WEAR SELF CONTAINED BREATHING APPARATUS,
RUBBER BOOTS & HEAVY RUBBER GLOVES. COVER W/DRY LIME/SODA ASH, PICK
UP, KEEP IN A CLOSED CONTAINER & HOLD FOR WASTE DISPOSAL. VENTILATE
AREA & WASH SITE AFTER MATERIAL PICKUP IS COMPLETE.

=====
===== Handling and Storage =====

Handling and Storage Precautions:STORE IN A COOL, DRY PLACE. KEEP
TIGHTLY CLOSED. WEAR SUITABLE PROTECTIVE CLOTHING.
Other Precautions:AVOID CONTACT & INHALATION. DON'T GET IN EYES, ON
SKIN/ON CLOTHING.

=====
===== Exposure Controls/Personal Protection =====

Respiratory Protection:USE NIOSH/MSHA APPROVED RESPIRATOR.
Ventilation:MECHANICAL EXHAUST
Protective Gloves:RUBBER
Eye Protection:CHEMICAL SAFETY GOGGLES
Other Protective Equipment:SAFETY SHOWER, EYE BATH, PROTECTIVE CLOTHING
Work Hygienic Practices:REMOVE/LAUNDER CONTAMINATED CLOTHING BEFORE
REUSE. WASH THOROUGHLY AFTER HANDLING.
Supplemental Safety and Health

=====
===== Physical/Chemical Properties =====

Spec Gravity:1.009
Appearance and Odor:VISCIOUS LIGHT YELLOW LIQUID

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid: YES
STRONG OXIDIZING AGENTS, STRONG REDUCING AGENTS
Stability Condition to Avoid: FIRE
Hazardous Decomposition Products: CO, CO2

===== Disposal Considerations =====

Waste Disposal Methods: DISSOLVE/MIX THE MATERIAL W/A COMBUSTIBLE
SOLVENT & BURN IN A CHEMICAL INCINERATOR EQUIPPED W/AN AFTERBURNER
& SCRUBBER. DISPOSE OF IAW/LOCAL, STATE & FEDERAL REGULATIONS.

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assume responsibility for the suitability of this information to their
particular situation.

Material Safety Data Sheet

Indigo Carmine (Cert.)

ACC# 01888

Section 1 - Chemical Product and Company Identification

MSDS Name: Indigo Carmine (Cert.)

Catalog Numbers: AC412300000, AC412300250

Synonyms: Acid Blue 74; C.I. 73015; 5,5'-Indigodisulfonic acid, disodium salt;

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
860-22-0	C.I. Acid Blue 74	ca. 100	212-728-8

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: dark blue solid.

Caution! May cause irritation. May be harmful if swallowed. Light sensitive. The toxicological properties of this material have not been fully investigated.

Target Organs: No data found.

Potential Health Effects

Eye: This product contains a cationic dye. Similar dyes have caused permanent injury to the cornea and conjunctiva in documented exposure cases with human or rabbit eyes.

Skin: May cause skin irritation.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. The toxicological properties of this substance have not been fully investigated. May be harmful if swallowed.

Inhalation: May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid. SPEEDY ACTION IS CRITICAL!

Skin: Get medical aid if irritation develops or persists. Flush skin with plenty of soap and water.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: In case of fire, use water, dry chemical, chemical foam, or alcohol-resistant foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Sweep up, then place into a suitable container for disposal. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation. Store protected from light.

Storage: Keep containers tightly closed. Store protected from light. Store in a cool, dry area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
C.I. Acid Blue 74	none listed	none listed	none listed

OSHA Vacated PELs: C.I. Acid Blue 74: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: dark blue

Odor: Not available.

pH: Not available.

Vapor Pressure: Negligible.

Vapor Density: Not available.

Evaporation Rate: Negligible.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: Not available.

Decomposition Temperature: Not available.

Solubility: 1 g/100 mL @ 25°C

Specific Gravity/Density: Not available.

Molecular Formula: C₁₆H₈N₂Na₂O₈S₂

Molecular Weight: 466.35

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, light.

Incompatibilities with Other Materials: Oxidizing agents, nitric acid.

Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, carbon dioxide, nitrogen gas.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 860-22-0: DU3000000

LD50/LC50:

CAS# 860-22-0:

Oral, mouse: LD50 = 2500 mg/kg;

Oral, rat: LD50 = 2 gm/kg;

Carcinogenicity:

CAS# 860-22-0: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No data available.

Teratogenicity: No data available.

Reproductive Effects: No data available.

Mutagenicity: No data available.

Neurotoxicity: No data available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.
RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 860-22-0 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 860-22-0 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations **European Labeling in Accordance with EC Directives** **Hazard Symbols:**

XN

Risk Phrases:

R 22 Harmful if swallowed.

Safety Phrases:

WGK (Water Danger/Protection)

CAS# 860-22-0: 1

Canada - DSL/NDSL

CAS# 860-22-0 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of Not controlled.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Indium(II) selenide

- Indium monoselenide

Formula	InSe
Structure	$\text{In}^{2+} \text{Se}^{2-}$
Description	Black hexagonal crystals.
Uses	Substance is used in semiconductor research.

Registry Numbers and Inventories.

CAS	1312-42-1
EC Index Number	034-002-00-8
EC Class	T; R23/25, R33, N; R50-53
UN (DOT)	3283
Merck	12,4986
Beilstein/Gmelin	13718 (G)

Properties.

Formula	InSe
Formula mass	193.78
Melting point, °C	660
Density	5.8 g/cm ³ (20 C)

Hazards and Protection.

Storage	Keep in a cool, dry, dark location in a tightly sealed container or cylinder. Keep away from incompatible materials, ignition sources and untrained individuals. Secure and label area. Protect containers/cylinders from physical damage.
Handling	All chemicals should be considered hazardous. Avoid direct physical contact. Use appropriate, approved safety equipment. Untrained individuals should not handle this chemical or its container. Handling should occur in a chemical fume hood.
Protection	Wear appropriate protective gloves, clothing and goggles.
Respirators	Wear positive pressure self-contained breathing apparatus (SCBA).
Small spills/leaks	Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Stop leak if you can do it without risk. Cover with plastic sheet to prevent spreading. Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers. DO NOT GET WATER INSIDE CONTAINERS.
Stability	No data.

Fire.

Fire fighting	Use method most appropriate to fight surrounding fire.
Fire potential	Non-Combustible
Combustion products	Fire may produce irritating, corrosive and/or toxic gases.

Health.

Exposure effects	The toxicological properties of this substance have not been fully investigated.
Inhalation	Highly toxic, may be fatal if inhaled, swallowed or absorbed through skin. Effects of contact or inhalation may be delayed.
Skin	Avoid any skin contact. See Inhalation.

Eyes See Inhalation.

First aid

Ingestion Seek medical assistance.

Inhalation Move victim to fresh air. Apply artificial respiration if victim is not breathing. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Administer oxygen if breathing is difficult.

Skin Remove and isolate contaminated clothing and shoes. Remove material from skin immediately. Immediately flush with running water for at least 20 minutes. For minor skin contact, avoid spreading material on unaffected skin.

Eyes Immediately flush with running water for at least 20 minutes.

Transportation.

UN number 3283

Response guide [151](#)

Hazard class 6.1



Packing Group I; II; III

USCG CHRIS Code SEC

Material Safety Data Sheet

Iodic Acid

ACC# 11180

Section 1 - Chemical Product and Company Identification

MSDS Name: Iodic Acid

Catalog Numbers: A158-100, S80044

Synonyms: Hydrogen Iodate

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7782-68-5	Iodic Acid	>99.5	231-962-1

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white to pale yellow solid.

Danger! Strong oxidizer. Contact with other material may cause a fire. Corrosive. Causes eye and skin burns. May cause severe respiratory tract irritation with possible burns. May cause severe digestive tract irritation with possible burns.

Target Organs: None known.

Potential Health Effects

Eye: Causes eye burns. May cause permanent corneal opacification. May cause chemical conjunctivitis and corneal damage.

Skin: Causes skin burns. May cause skin rash (in milder cases), and cold and clammy skin with cyanosis or pale color.

Ingestion: May cause severe and permanent damage to the digestive tract. Causes

gastrointestinal tract burns. May cause perforation of the digestive tract. May cause systemic effects. May cause nausea, vomiting, and diarrhea, possibly with blood.

Inhalation: Causes chemical burns to the respiratory tract. May cause systemic effects. May cause acute pulmonary edema, asphyxia, chemical pneumonitis, and upper airway obstruction caused by edema.

Chronic: Effects may be delayed.

Section 4 - First Aid Measures

Eyes: Get medical aid immediately. Do NOT allow victim to rub eyes or keep eyes closed. Extensive irrigation with water is required (at least 30 minutes).

Skin: Get medical aid immediately. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Destroy contaminated shoes.

Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Get medical aid immediately.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid. Do NOT use mouth-to-mouth resuscitation. If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Strong oxidizer. Contact with other material may cause fire. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Substance is noncombustible. Use water with caution and in flooding amounts. Oxidizer. Greatly increases the burning rate of combustible materials.

Extinguishing Media: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire. Contact professional fire-fighters immediately.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 3; Flammability: 0; Instability: 1; Special Hazard: OX

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Wear a self contained breathing apparatus and appropriate personal protection. (See Exposure Controls, Personal Protection section). Sweep up, then place into a suitable container for disposal. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Remove contaminated clothing and wash before reuse. Minimize dust generation and accumulation. Do not get in eyes, on skin, or on clothing. Keep container tightly closed. Avoid contact with clothing and other combustible materials. Avoid ingestion and inhalation. Use with adequate ventilation. Discard contaminated shoes.

Storage: Keep away from heat, sparks, and flame. Do not store near combustible materials. Do not store in direct sunlight. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Corrosives area.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Iodic Acid	none listed	none listed	none listed

OSHA Vacated PELs: Iodic Acid: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear a chemical apron. Wear appropriate clothing to prevent skin exposure.

Respirators: Wear a NIOSH/MSHA or European Standard EN 149 approved full-facepiece airline respirator in the positive pressure mode with emergency escape provisions.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white to pale yellow
Odor: none reported
pH: Acidic in solution.
Vapor Pressure: Negligible.
Vapor Density: Not available.
Evaporation Rate: Negligible.
Viscosity: Not available.
Boiling Point: Not available.
Freezing/Melting Point: 110 deg C
Decomposition Temperature: 110 deg C
Solubility: 2.8 kg/L H₂O @ 0°C
Specific Gravity/Density: 4.629 (water=1)
Molecular Formula: HIO₃
Molecular Weight: 175.9097

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Incompatible materials, light, ignition sources, dust generation, combustible materials, reducing agents.
Incompatibilities with Other Materials: Reducing agents.
Hazardous Decomposition Products: Irritating and toxic fumes and gases, iodine.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 7782-68-5 unlisted.
LD50/LC50:
Not available.

Carcinogenicity:
CAS# 7782-68-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found
Teratogenicity: No information found
Reproductive Effects: No information found
Mutagenicity: No information found
Neurotoxicity: No information found
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	OXIDIZING SOLID, CORROSIVE, N.O.S.	No information available.
Hazard Class:	5.1	
UN Number:	UN3085	
Packing Group:	II	

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7782-68-5 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

SARA Codes

CAS # 7782-68-5: immediate, fire.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7782-68-5 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

O C

Risk Phrases:

R 34 Causes burns.

R 8 Contact with combustible material may cause fire.

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 28 After contact with skin, wash immediately with...

WGK (Water Danger/Protection)

CAS# 7782-68-5: 1

Canada - DSL/NDSL

CAS# 7782-68-5 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of C, E.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Iron

ACC# 11490

Section 1 - Chemical Product and Company Identification

MSDS Name: Iron

Catalog Numbers: S71953, S71953-1, S71953-2, S93268, I60-3, I60-500, I62-500

Synonyms: Iron Dust; Iron Metal; Iron Powder.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7439-89-6	IRON	>97	231-096-4

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: black to gray solid.

Warning! Flammable solid. May cause mechanical eye and skin irritation. May cause blood abnormalities. May cause lung damage. Inhalation of fumes may cause metal-fume fever. May cause cardiac disturbances. May cause liver damage.

Target Organs: Liver, respiratory system, cardiovascular system, pancreas.

Potential Health Effects

Eye: Exposure to particulates or solution may cause conjunctivitis, ulceration, and corneal abnormalities.

Skin: May cause skin irritation.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. Acute toxicity may include weakness, shock, cyanosis and acidosis. Delayed symptoms may

include liver

Inhalation: Inhalation of fumes may cause metal fume fever, which is characterized by flu-like symptoms with metallic taste, fever, chills, cough, weakness, chest pain, muscle pain and increased white blood cell count. May cause lung damage.

Chronic: Chronic exposure may lead to liver and lung damage. Repeated exposure may cause pancreatic damage, diabetes, and cardiac abnormalities.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Get medical aid immediately.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Antidote: The use of Deferoxamine as a chelating agent should be determined only by qualified medical personnel.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Dusts at sufficient concentrations can form explosive mixtures with air. Combustion generates toxic fumes.

Extinguishing Media: Use only graphite powder, soda ash, powdered sodium chloride, or an appropriate metal-fire-extinguishing dry powder.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 1; Instability: 1

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Sweep up or absorb material, then place into a suitable clean, dry, closed container for disposal. Avoid generating dusty conditions. Remove all sources of ignition.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Keep from contact with oxidizing materials. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use process enclosure, local exhaust ventilation, or other engineering controls to control airborne levels.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
IRON	none listed	none listed	none listed

OSHA Vacated PELs: IRON: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear impervious gloves.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: black to gray

Odor: none reported

pH: Not available.

Vapor Pressure: 1 mm Hg @ 1787 deg C

Vapor Density: Not available.

Evaporation Rate: Negligible.

Viscosity: Not available.

Boiling Point: 2750 deg C
Freezing/Melting Point:1535 deg C
Decomposition Temperature:Not available.
Solubility: Insoluble in water.
Specific Gravity/Density:7.86 @ 20°C
Molecular Formula:Fe
Molecular Weight:55.847

Section 10 - Stability and Reactivity

Chemical Stability: Decomposes when heated. Oxidizes when exposed to air.
Conditions to Avoid: Incompatible materials, moisture, exposure to air, excess heat.
Incompatibilities with Other Materials: Acetaldehyde, ammonium peroxodisulfate, chloroformamidinium, chloric acid, ammonium nitrate, halogens, dinitrogen tetroxide, nitryl fluoride, polystyrene, sodium acetylide, potassium dichromate, peroxyformic acid, nitryl fluoride, sulfuric acid, sodium carbide.
Hazardous Decomposition Products: Oxides of iron.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 7439-89-6: NO4565500; NO8225000
LD50/LC50:
CAS# 7439-89-6:
Oral, rat: LD50 = 30 gm/kg;

Carcinogenicity:
CAS# 7439-89-6: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.
Teratogenicity: No information available.
Reproductive Effects: No information available.
Mutagenicity: No information available.
Neurotoxicity: No information available.
Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information reported.

Physical: No information available.

Other: None.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	METAL POWDERS, FLAMMABLE, N.O.S.	METAL POWDER FLAMMABLE NOS (IRON)
Hazard Class:	4.1	4.1
UN Number:	UN3089	UN3089
Packing Group:	II	III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7439-89-6 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 7439-89-6: immediate, fire.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7439-89-6 can be found on the following state right to know lists: California.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

WGK (Water Danger/Protection)

CAS# 7439-89-6: 0

Canada - DSL/NDSL

CAS# 7439-89-6 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of B4, D2B.

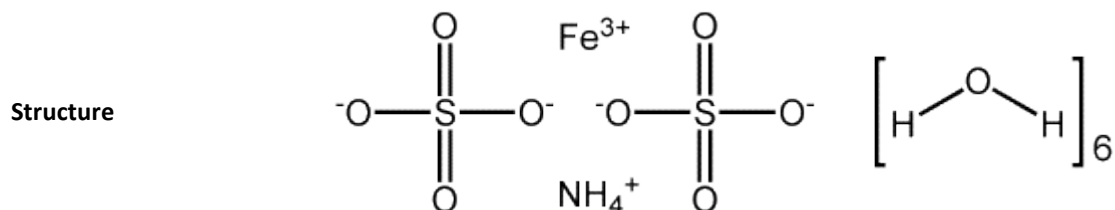
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Ferric ammonium sulfate hexahydrate

- Ammonium ferric sulfate hexahydrate
- Iron(III) ammonium sulfate hexahydrate

Formula $(\text{NH}_4)_2\text{Fe}(\text{SO}_4)_2 \cdot 6\text{H}_2\text{O}$



Description Light green powder with a sulforous odor.

Uses Herbicide.

Registry Numbers and Inventories.

CAS 7783-85-9

NIH PubChem CID 197098

EC (EINECS/ELINCS) 616-518-0

RTECS BR6500000

RTECS class Other

UN (DOT) 9119

Beilstein/Gmelin 109801 (G)

EPA OPP 50509

Swiss Giftliste 1 G-4755

Australia AICS Listed

New Zealand Listed

Philippiens PICCS Listed

Properties.

Formula FeH20N2O14S2

Formula mass 392.14

Melting point, °C 100

Density 1.864 g/cm³

Solubility in water Soluble

Hazards and Protection.

Storage Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Do not expose to air. Store protected from light. Store under an inert atmosphere.

Handling Wash hands before eating. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation. Use with adequate ventilation. Store protected from light. Handle under an inert atmosphere. Store protected from air. Wash clothing before reuse.

Protection Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166. Skin: Wear appropriate protective gloves to prevent skin exposure. Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant a respirator's use.

Small spills/leaks Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, using the appropriate protective equipment. Avoid generating

dusty conditions. Provide ventilation. Place under an inert atmosphere.

Stability

Stable at room temperature in closed containers under normal storage and handling conditions.

Incompatibilities

Strong oxidizing agents, strong acids, air.

Decomposition

Irritating and toxic fumes and gases, sulfur oxides (SOx), including sulfur oxide and sulfur dioxide, ammonia.

Fire.

Fire fighting

Wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.
Extinguishing media: Use agent most appropriate to extinguish fire. In case of fire use water spray, dry chemical, carbon dioxide, or appropriate foam.

Fire potential

May burn but does not ignite readily.

Hazards

Containers may explode when heated.

Combustion products

During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

NFPA

Health 2

Flammability 0

Reactivity 0

Health.

Exposure limit(s)

OEL-UNITED KINGDOM:TWA 1 mg(Fe)/m³;STEL 2 mg(Fe)/m³ JANUARY 1993

Poison_Class

3

Exposure effects Effects may be delayed. Chronic exposure may cause liver damage.

Ingestion May cause gastrointestinal irritation with nausea, vomiting and diarrhea. May cause liver damage. May cause cardiac disturbances.

Inhalation Causes respiratory tract irritation. Can produce delayed pulmonary edema.

Skin Causes skin irritation.

Eyes Causes eye irritation. May cause chemical conjunctivitis.

First aid

Ingestion Never give anything by mouth to an unconscious person. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water. Wash mouth out with water. Get medical aid if irritation or symptoms occur.

Inhalation Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear. DO NOT use mouth-to-mouth respiration.

Skin Flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists. Wash clothing before reuse.

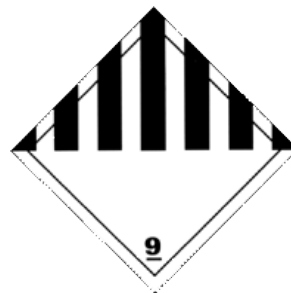
Eyes Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Transportation.

UN number 9119

Response guide [171](#)

Hazard class 9

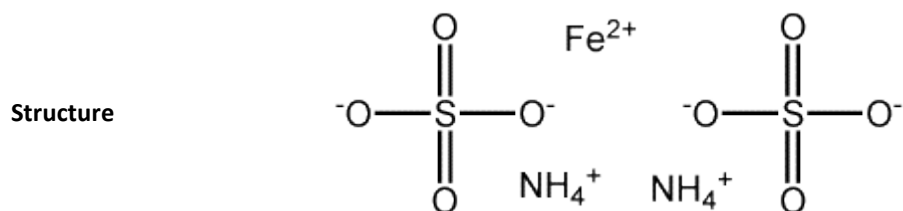


HS Code 2842 90 90

Ferrous ammonium sulfate

- Ammonium ferrous sulfate
- Diammonium iron bis(sulfate)
- Vitaferro

Formula $(\text{NH}_4)_2\text{Fe}(\text{SO}_4)_2$



Description A light green crystalline solid.

Uses In photography, as analytical standard, as polymerization catalyst, in dosimeters.

Registry Numbers and Inventories.

CAS	10045-89-3
NIH PubChem CID	24863
EC (EINECS/ELINCS)	233-151-8
RTECS	WS5890000
RTECS class	Other
UN (DOT)	9122
Merck	12,552
Beilstein/Gmelin	34557 (G)
EPA OPP	50506

Canada DSL/NDSL	DSL
US TSCA	Listed
Australia AICS	Listed
New Zealand	Listed
Korea ECL	Listed
Philippiens PICCS	Listed

Properties.

Formula	FeH8N2O8S2
Formula mass	284.05
Melting point, °C	100
Vapor density (air=1)	>1
Density	1.86 g/cm ³ (20 C)
Solubility in water	269 g/L

Hazards and Protection.

Storage	Keep containers tightly closed in a well ventilated area away from food products. Keep away from heat, light, and water. Material will absorb moisture from the atmosphere.
Handling	All chemicals should be considered hazardous. Avoid direct physical contact. Use appropriate, approved safety equipment. Untrained individuals should not handle this chemical or its container. Handling should occur in a chemical fume hood.
Protection	Dust mask; goggles or face shield; protective gloves.

Respirators	Wear positive pressure self-contained breathing apparatus (SCBA).
Small spills/leaks	Keep material out of water sources and sewers. Build dikes to contain flow as necessary. Land spill: Dig a pit, pond, lagoon, holding area to contain liquid or solid material. Cover solids with a plastic sheet to prevent dissolving in rain or fire fighting water. Water spill: Allow to aerate. Neutralize with agricultural lime (CaO), crushed limestone (CaCO ₃), or sodium bicarbonate (NaHCO ₃). Adjust pH to neutral (pH=7). Use mechanical dredges or lifts to remove immobilized masses of pollutants and precipitates.
Stability	Slowly oxidizes in air. Ferrous ammonium sulfate hexahydrate.
Incompatibilities	Incompatible with sulfuric acid.

Fire.

Fire fighting	Extinguish fire using agent suitable for type of surrounding fire. (Material itself does not burn or burns with difficulty.)						
Fire potential	Nonflammable.						
Hazards	Containers may explode when heated.						
Combustion products	Irritating and toxic ammonia and oxides of nitrogen may form in fires.						
NFPA	<table> <tr> <td>Health</td> <td>2</td> </tr> <tr> <td>Flammability</td> <td>0</td> </tr> <tr> <td>Reactivity</td> <td>0</td> </tr> </table>	Health	2	Flammability	0	Reactivity	0
Health	2						
Flammability	0						
Reactivity	0						

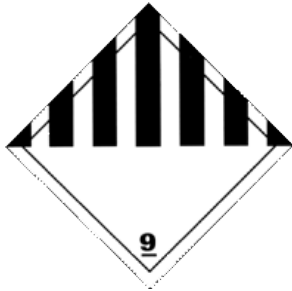
Health.

Exposure effects	Blood pressure may be decreased following an iron overdose. Lethargy, restlessness or confusion may be seen early in the poisoning. Convulsions and coma may occur in later phases. Case reports of pregnant women who have received early aggressive treatment (decontamination and/or deferoxamine) have described good fetal outcomes.
Ingestion	Nausea, vomiting, diarrhea and gastrointestinal hemorrhage may develop.
Inhalation	Noncardiogenic pulmonary edema may develop with severe intoxication.
Skin	Severe thermal burn with ferrous sulfate slurry has caused classical symptoms of ingested iron poisoning.
Eyes	Irritants may cause swelling, redness and pain at any site, especially at mucous membranes. The mouth, nose, and eyes are susceptible to these effects.
First aid	

Ingestion	The possible benefit of early removal of some ingested material by cautious gastric lavage must be weighed against potential complications of bleeding or perforation. Activated charcoal binds most toxic agents and can decrease their systemic absorption if administered soon after ingestion. Administer charcoal as a slurry (240 ml water/30 g charcoal). Usual dose: 25 to 100 g in adults/adolescents.
Inhalation	Move victim to fresh air. Apply artificial respiration if victim is not breathing. Administer oxygen if breathing is difficult.
Skin	Remove and isolate contaminated clothing and shoes. Immediately flush with running water for at least 20 minutes.
Eyes	Immediately flush with running water for at least 20 minutes.

Transportation.

UN number	9122
Response guide	171
Hazard class	9
USCG CHRIS Code	FAS
Std. Transport #	4962640 4962641



Iron(II) sulfide

- Ferrous sulfide
- Thioxoiron
- Troilite

Formula	FeS
Structure	$\text{Fe}^{2+} \text{S}^{2-}$
Description	Black powder.
Uses	As lab source of hydrogen sulfide, in the ceramic industry, as paintermediateiate pigment, in anodes, in lubricant coatings.

Registry Numbers and Inventories.

CAS	1317-37-9
NIH PubChem CID	14828
EC (EINECS/ELINCS)	215-268-6
Merck	12,4106
Beilstein/Gmelin	13588 (G)
Swiss Giftliste 1	G-8176
Canada DSL/NDSL	DSL
US TSCA	Listed
Austrailia AICS	Listed
New Zealand	Listed
Japan ENCS (MITI)	Listed
Korea ECL	Listed
Philippiens PICCS	Listed

Properties.

Formula	FeS
Formula mass	87.92
Melting point, °C	1195
Boiling point, °C	(decomposes)
Vapor pressure, mmHg	1.1144 (1300 C)
Density	4.694 g/cm ³
Solubility in water	Insoluble
Viscosity	3.43 cp (1250 C)

Heat of fusion 11.74 kJ/mol

Hazards and Protection.

Storage	Store in a cool, dry, well-ventilated area away from incompatible substances.
Handling	Use with adequate ventilation. Avoid contact with skin and eyes. Avoid ingestion and inhalation.
Protection	Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166. Skin: Wear appropriate protective gloves to prevent skin exposure. Clothing: Wear appropriate protective clothing to prevent skin exposure.
Respirators	Follow the OSHA respirator regulations found in 29CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.
Small spills/leaks	Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions.
Disposal code	15
Stability	Stable under normal temperatures and pressures.
Incompatibilities	Strong acids.
Decomposition	Oxides of sulfur, hydrogen sulfide.

Fire.

Fire fighting	Wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Extinguishing media: For small fires, use water spray, dry chemical, carbon dioxide or chemical foam.
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Health.

Exposure limit(s)	NIOSH TWA: 1 mg/m ³
Poison_Class	3
Exposure effects	Blood pressure may be decreased following an iron overdose. Lethargy, restlessness or confusion may be seen early in the poisoning. Convulsions and coma may occur in later phases. Case reports of pregnant women who have received early aggressive treatment (decontamination and/or deferoxamine) have described good fetal outcomes.
Ingestion	May cause irritation of the digestive tract. The toxicological properties of this substance have not been fully investigated.
Inhalation	May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated.
Skin	May cause skin irritation.
Eyes	Dust may cause mechanical irritation.

First aid**Ingestion**

If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation

Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Skin

Flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Eyes

Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Transportation.**HS Code**

2830 90 11

Material Safety Data Sheet

Iron(III)sulfate pentahydrate

ACC# 01891

Section 1 - Chemical Product and Company Identification

MSDS Name: Iron(III)sulfate pentahydrate

Catalog Numbers: AC345230000, AC345230050, AC345235000

Synonyms: None known.

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
142906-29-4	Iron(III)sulfate pentahydrate	97%	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: yellow to yellow-green crystalline powder.

Caution! May cause eye, skin, and respiratory tract irritation. Hygroscopic (absorbs moisture from the air). The toxicological properties of this material have not been fully investigated.

Target Organs: None known.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation. May be harmful if absorbed through the skin.

Ingestion: May cause irritation of the digestive tract. May be harmful if swallowed.

Inhalation: May cause respiratory tract irritation. May be harmful if inhaled.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. If irritation develops, get medical aid.

Skin: Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: Do not induce vomiting. Get medical aid if irritation or symptoms occur.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or chemical foam.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 1; Instability: 1

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation. Do not let this chemical enter the environment.

Section 7 - Handling and Storage

Handling: Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation.

Storage: Store in a cool, dry place. Store in a tightly closed container.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Iron(III)sulfate pentahydrate	none listed	none listed	none listed
Iron(III) sulfate	1 mg/m ³ TWA (as Fe) (listed under Iron salts (soluble)).	1 mg/m ³ TWA (as Fe) (listed under Iron salts (soluble)).	none listed

OSHA Vacated PELs: Iron(III)sulfate pentahydrate: No OSHA Vacated PELs are listed for this chemical. Iron(III) sulfate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Crystalline powder

Appearance: yellow to yellow-green

Odor: none reported

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate:Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point:Not available.

Decomposition Temperature:Not available.

Solubility: Not available.

Specific Gravity/Density:Not available.

Molecular Formula:Fe₂O₃·5H₂O

Molecular Weight:489.94

Section 10 - Stability and Reactivity

Chemical Stability: Light sensitive. Hygroscopic: absorbs moisture or water from the air.
Conditions to Avoid: Incompatible materials, light, dust generation, exposure to moist air or water.
Incompatibilities with Other Materials: Strong oxidizing agents.
Hazardous Decomposition Products: Oxides of sulfur.
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 142906-29-4 unlisted.

CAS# 10028-22-5: NO8505000

LD50/LC50:

Not available.

Not available.

Carcinogenicity:

CAS# 142906-29-4: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 10028-22-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: Mutation in microorganisms: See actual entry in RTECS for complete information.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information available.

Physical: No information available.

Other: Do not empty into drains.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR

Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not Regulated	Not Regulated
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 142906-29-4 is not listed on the TSCA inventory. It is for research and development use only.

CAS# 10028-22-5 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 10028-22-5: 1000 lb final RQ; 454 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

CAS# 10028-22-5 is listed as a Hazardous Substance under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 142906-29-4 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

CAS# 10028-22-5 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, (listed as Iron salts (soluble)), Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

Not available.

Risk Phrases:**Safety Phrases:**

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 142906-29-4: No information available.

CAS# 10028-22-5: 1

Canada - DSL/NDSL

CAS# 10028-22-5 is listed on Canada's DSL List.

Canada - WHMIS

not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 10028-22-5 (listed as Iron salts (soluble)) is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Iron(II) sulfate heptahydrate

ACC# 09870

Section 1 - Chemical Product and Company Identification

MSDS Name: Iron(II) sulfate heptahydrate

Catalog Numbers: I146-10, I146-3, I146-3LC, I146-500, I146-500LC, I149-3

Synonyms: Green vitrol; Ferrous sulfate heptahydrate; Iron protosulfate.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7782-63-0	Iron(II) sulfate heptahydrate	>99	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: blue-green solid.

Warning! Harmful if swallowed. Causes eye and skin irritation. May cause respiratory tract irritation.

Target Organs: Blood, kidneys, central nervous system, liver, gastrointestinal system, eyes, skin.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Causes skin irritation. May be harmful if absorbed through the skin.

Ingestion: Harmful if swallowed. May cause irritation of the digestive tract. May cause nausea and vomiting.

Inhalation: May cause respiratory tract irritation. May be harmful if inhaled.

Chronic: May cause liver and kidney damage. Adverse reproductive effects have been reported in animals. Laboratory experiments have resulted in mutagenic effects. Chronic exposure may cause blood effects. Exposure to high concentrations may cause central nervous system depression. Animal studies have reported the development of tumors. Oral doses of 960 mg/kg given intermittently over a 9 week period produced jaundice in

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: Do not induce vomiting. Get medical aid immediately. Call a poison control center.

Inhalation: Remove from exposure and move to fresh air immediately. If breathing is difficult, give oxygen. Get medical aid. Do not use mouth-to-mouth resuscitation if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or chemical foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 1; Instability: 1

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation. Do not let this chemical enter the environment.

Section 7 - Handling and Storage

Handling: Use with adequate ventilation. Minimize dust generation and accumulation. Do not get in eyes, on skin, or on clothing. Do not ingest or inhale.

Storage: Store in a cool, dry place. Store in a tightly closed container. Store under an inert atmosphere.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Iron(II) sulfate heptahydrate	1 mg/m ³ TWA (as Fe) (listed under Iron salts (soluble)).	1 mg/m ³ TWA (as Fe) (listed under Iron salts (soluble)).	none listed
Ferrous sulfate anhydrous	1 mg/m ³ TWA (as Fe) (listed under Iron salts (soluble)).	1 mg/m ³ TWA (as Fe) (listed under Iron salts (soluble)).	none listed

OSHA Vacated PELs: Iron(II) sulfate heptahydrate: No OSHA Vacated PELs are listed for this chemical. Ferrous sulfate anhydrous: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: blue-green

Odor: odorless

pH: 3-5 (5% aq. sol.)

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate:Negligible.
Viscosity: Not available.
Boiling Point: 300 deg C
Freezing/Melting Point:64 deg C
Decomposition Temperature:> 300 deg C
Solubility: 48.6g/100g water at 50C
Specific Gravity/Density:1.898
Molecular Formula:FeSO4.7H2O
Molecular Weight:278.01

Section 10 - Stability and Reactivity

Chemical Stability: Air sensitive. Moisture sensitive.
Conditions to Avoid: Incompatible materials, dust generation, exposure to air, excess heat, exposure to moist air or water.
Incompatibilities with Other Materials: Strong oxidizing agents, strong bases.
Hazardous Decomposition Products: Oxides of sulfur, oxides of iron.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 7782-63-0: NO8510000

CAS# 7720-78-7: NO8500000

LD50/LC50:

CAS# 7782-63-0:

Oral, mouse: LD50 = 1520 mg/kg;

CAS# 7720-78-7:

Oral, mouse: LD50 = 680 mg/kg;

Oral, rat: LD50 = 319 mg/kg;

Oral, rat: LD50 = 533 mg/kg;

Carcinogenicity:

CAS# 7782-63-0: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 7720-78-7: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: Tumorigenic effects have been reported in experimental animals.

Teratogenicity: Teratogenic effects have occurred in experimental animals.

Reproductive Effects: Adverse reproductive effects have occurred in experimental animals.

Mutagenicity: Mutagenic effects have occurred in humans.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information available.

Physical: No information available.

Other: Do not empty into drains.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not Regulated	Not Regulated
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7782-63-0 is not on the TSCA Inventory because it is a hydrate. It is considered to be listed if the CAS number for the anhydrous form is on the inventory (40CFR720.3(u)(2)).

CAS# 7720-78-7 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 7782-63-0: 1000 lb final RQ (listed under Ferrous sulfate); 454 kg final RQ (listed under F
CAS# 7720-78-7: 1000 lb final RQ; 454 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 7782-63-0: immediate.

CAS # 7720-78-7: immediate.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

CAS# 7782-63-0 is listed as a Hazardous Substance under the CWA. CAS# 7720-78-7 is listed as a Hazardous Substance under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7782-63-0 can be found on the following state right to know lists: California, (listed as Iron salts (soluble)), Pennsylvania, Minnesota, (listed as Iron salts (soluble)), Massachusetts.

CAS# 7720-78-7 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, (listed as Iron salts (soluble)), Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XN

Risk Phrases:

R 22 Harmful if swallowed.

R 36/38 Irritating to eyes and skin.

Safety Phrases:

S 46 If swallowed, seek medical advice immediately and show this container or label.

WGK (Water Danger/Protection)

CAS# 7782-63-0: No information available.

CAS# 7720-78-7: 1

Canada - DSL/NDSL

CAS# 7720-78-7 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 7782-63-0 (listed as Iron salts (soluble)) is listed on the Canadian Ingredient Disclosure List.

CAS# 7720-78-7 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

L-Arginine

ACC# 12379

Section 1 - Chemical Product and Company Identification

MSDS Name: L-Arginine

Catalog Numbers: BP2505-1, BP2505-100, BP2505-500, BP370-100, BP370-100LC, NC9170545, XXBP3725KG

Synonyms: Arginine, L-; Arginine; L-(+)-Arginine; S-(+)-Arginine

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
74-79-3	L-Arginine	>98.5	200-811-1

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white crystalline powder.

Caution! May cause eye and skin irritation. May cause respiratory and digestive tract irritation. Light sensitive. Moisture sensitive. The toxicological properties of this material have not been fully investigated.

Target Organs: No data found.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation. May cause erythema (redness) and edema (fluid buildup) with crusting and scaling.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. The

toxicological properties of this substance have not been fully investigated.

Inhalation: May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated.

Chronic: Laboratory experiments have resulted in mutagenic effects.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Dusts at sufficient concentrations can form explosive mixtures with air. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Non-combustible, substance itself does not burn but may decompose upon heating to produce irritating, corrosive and/or toxic fumes.

Extinguishing Media: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire. Do NOT get water inside containers. Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container.

Clean up spills immediately, observing precautions in the Protective Equipment section.

Avoid generating dusty conditions. Provide ventilation. Do not get water inside containers.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation. Store protected from light. Do not allow contact with water. Keep from contact with moist air and steam.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Store protected from moisture. Store protected from light.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
L-Arginine	none listed	none listed	none listed

OSHA Vacated PELs: L-Arginine: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Crystalline powder

Appearance: white

Odor: none reported

pH: 11.4

Vapor Pressure: Negligible.

Vapor Density: Not available.

Evaporation Rate: Negligible.
Viscosity: Not available.
Boiling Point: Not available.
Freezing/Melting Point: 223 - 224 deg C
Decomposition Temperature: 224 deg C
Solubility: Soluble.
Specific Gravity/Density: 1.3 (water=1)
Molecular Formula: C₆H₁₄N₄O₂
Molecular Weight: 174.1236

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions. Materials containing similar functional groups can decompose at elevated temperatures.

Conditions to Avoid: High temperatures, incompatible materials, light, dust generation, moisture.

Incompatibilities with Other Materials: Strong oxidizing agents, moisture.

Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, irritating and toxic fumes and gases, carbon dioxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 74-79-3: CF1934200

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 74-79-3: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: Mutagenic effects have occurred in experimental animals.

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 74-79-3 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 74-79-3 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

Not available.

Risk Phrases:**Safety Phrases:****WGK (Water Danger/Protection)**

CAS# 74-79-3: 0

Canada - DSL/NDSL

CAS# 74-79-3 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

L-(+)-glutamine

ACC# 12372

Section 1 - Chemical Product and Company Identification

MSDS Name: L-(+)-glutamine

Catalog Numbers: BP379-100, MT25005CIEM, NC9553689, NC9635202, NC9945819, O2956-100

Synonyms: Glutamine, L-; 2-Aminoglutaramic acid; L-2-Aminoglutaramidic acid; Glutamic acid amide; Glutamic acid 5-amide; gamma-Glutamine * L-Glutamine * Levoglutamid * Levoglutamide

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
56-85-9	L-glutamine	99-100	200-292-1

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white powder.

Warning! Irritant. Causes eye, skin, and respiratory tract irritation. The toxicological properties of this material have not been fully investigated.

Target Organs: Respiratory system, eyes, skin.

Potential Health Effects

Eye: Causes eye irritation. May cause chemical conjunctivitis.

Skin: Causes skin irritation. May be harmful if absorbed through the skin.

Ingestion: May cause irritation of the digestive tract. Expected to be a low ingestion

hazard.

Inhalation: Causes respiratory tract irritation. May be harmful if inhaled.

Chronic: Laboratory experiments have resulted in mutagenic effects.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Dusts at sufficient concentrations can form explosive mixtures with air. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use agent most appropriate to extinguish fire. Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up or absorb material, then place into a suitable clean, dry, closed container for disposal. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Use spark-proof tools and explosion proof equipment. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
L-glutamine	none listed	none listed	none listed

OSHA Vacated PELs: L-glutamine: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Powder

Appearance: white

Odor: practically odorless

pH: 4-6 (2.5% aq. solution)

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Negligible.

Viscosity: Not available.
Boiling Point: Not available.
Freezing/Melting Point:185 deg C
Decomposition Temperature:185-186 deg C
Solubility: Moderately soluble in water.
Specific Gravity/Density:Not available.
Molecular Formula:C5H10N2O3
Molecular Weight:146.0816

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Incompatible materials, dust generation, excess heat.
Incompatibilities with Other Materials: Strong oxidizing agents.
Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, carbon dioxide, ammonia.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 56-85-9: MA2275100
LD50/LC50:
CAS# 56-85-9:
Oral, mouse: LD50 = 21700 mg/kg;
Oral, rat: LD50 = 7500 mg/kg;

Carcinogenicity:
CAS# 56-85-9: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found
Teratogenicity: No information found
Reproductive Effects: No information found
Mutagenicity: No information found
Neurotoxicity: No information found
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated.	Not regulated.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 56-85-9 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 56-85-9 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

XI

Risk Phrases:

R 36/37/38 Irritating to eyes, respiratory system and skin.

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 36/37/39 Wear suitable protective clothing, gloves and eye/face protection.

WGK (Water Danger/Protection)

CAS# 56-85-9: 0

Canada - DSL/NDSL

CAS# 56-85-9 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

L-Arabinose

ACC# 29177

Section 1 - Chemical Product and Company Identification

MSDS Name: L-Arabinose

Catalog Numbers: AC401430000, AC401430250, AC401431000

Synonyms: None known.

Company Identification:

Acros Organics N.V.

One Reagent Lane

Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
5328-37-0	L-Arabinose	100.0	226-214-6

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white powder.

Caution! This is expected to be a low hazard for usual industrial handling.

Target Organs: No data found.

Potential Health Effects

Eye: May cause mild eye irritation.

Skin: Non-irritating to the skin.

Ingestion: Expected to be a low ingestion hazard.

Inhalation: Low hazard for usual industrial handling.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. If irritation develops, get medical aid.

Skin: Get medical aid if irritation develops or persists. Flush skin with plenty of soap and water.

Ingestion: Wash mouth out with water. Get medical aid if irritation or symptoms occur.

Inhalation: Remove from exposure and move to fresh air immediately. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: In case of fire, use water, dry chemical, chemical foam, or alcohol-resistant foam. Use agent most appropriate to extinguish fire.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 0; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Sweep up, then place into a suitable container for disposal. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Provide ventilation. Minimize dust generation and accumulation. Use with adequate ventilation.

Storage: Store in a cool, dry place. Keep container closed when not in use. No special precautions indicated.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate ventilation to keep airborne concentrations low.
Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
L-Arabinose	none listed	none listed	none listed

OSHA Vacated PELs: L-Arabinose: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Powder

Appearance: white

Odor: none reported

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 155 deg C

Decomposition Temperature: Not available.

Solubility: Soluble.

Specific Gravity/Density: >1.0

Molecular Formula: C₅H₁₀O₅

Molecular Weight: 150.13

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Dust generation, excess heat.

Incompatibilities with Other Materials: Strong oxidizing agents.

Hazardous Decomposition Products: Carbon monoxide, carbon monoxide, carbon

dioxide.

Hazardous Polymerization: Has not been reported

Section 11 - Toxicological Information

RTECS#:

CAS# 5328-37-0 unlisted.

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 5328-37-0: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		

UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 5328-37-0 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 5328-37-0 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 5328-37-0: No information available.

Canada - DSL/NDSL

CAS# 5328-37-0 is listed on Canada's DSL List.

Canada - WHMIS

WHMIS: Not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

DI-citrulline, 97%

ACC# 00931

Section 1 - Chemical Product and Company Identification

MSDS Name: DI-citrulline, 97%

Catalog Numbers: AC227090000, AC227090050

Synonyms: DL-2-Amino-5-ureidovaleric acid

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
627-77-0	DI-citrulline	97.0	211-012-2

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid.

Caution! May cause irritation. The toxicological properties of this material have not been fully investigated.

Target Organs: None known.

Potential Health Effects

Eye: No information regarding eye irritation and other potential effects was found.

Skin: No information regarding skin irritation and other potential effects was found.

Ingestion: The toxicological properties of this substance have not been fully investigated.

Inhalation: The toxicological properties of this substance have not been fully investigated.

Inhalation of dust may cause respiratory tract irritation.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or chemical foam.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: Not published.

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate ventilation to keep airborne concentrations low.
Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
DI-citrulline	none listed	none listed	none listed

OSHA Vacated PELs: DI-citrulline: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white

Odor: Not available.

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: Not available.

Decomposition Temperature: Not available.

Solubility: soluble

Specific Gravity/Density: Not available.

Molecular Formula: C₆H₁₃N₃O₃

Molecular Weight: 175.19

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, dust generation.

Incompatibilities with Other Materials: Oxidizing agents

Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, carbon dioxide.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 627-77-0 unlisted.

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 627-77-0: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No data available.

Teratogenicity: No data available.

Reproductive Effects: No data available.

Mutagenicity: No data available.

Neurotoxicity: No data available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		

UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 627-77-0 is not listed on the TSCA inventory. It is for research and development use only.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 627-77-0 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 627-77-0: No information available.

Canada - DSL/NDSL

None of the chemicals in this product are listed on the DSL or NDSL list.

Canada - WHMIS

WHMIS: Not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

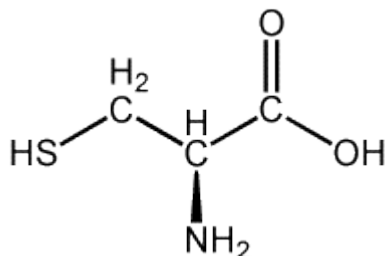
Canadian Ingredient Disclosure List

L-(+)-Cysteine

- (+)-2-Amino-3-mercaptopropionic acid
- (2R)-2-Amino-3-sulfanylpropanoic acid

Formula C₃H₇NO₂S

Structure



Description Crystals.

Uses Biochemical and nutrition research, reducing agent in bread doughs (up to 90 ppm).

Registry Numbers and Inventories.

CAS	52-90-4
NIH PubChem CID	5862
EC (EINECS/ELINCS)	200-158-2
EC Class	Xn, R: 22, S: 22-36/37
RTECS	HA1600000
RTECS class	Drug; Mutagen; Reproductive Effector
Merck	13,2810
Beilstein/Gmelin	1721408
Beilstein Reference	4-04-00-03144
FEMA	3263
Swiss Giftliste 1	G-8327
Canada DSL/NDSL	DSL
US TSCA	Listed
Australia AICS	Listed
New Zealand	Listed
Japan ENCS (MITI)	Listed
Korea ECL	Listed
Philippiens PICCS	Listed

Properties.

Formula	C3H7NO2S
Formula mass	121.16
Melting point, °C	115
Boiling point, °C	254
Vapor density (air=1)	4.2
Critical temperature	479
Critical pressure	59.5
Density	1.523 g/cm ³
Solubility in water	280 g/L
Partition coefficient, pK_{ow}	-0.92

Hazards and Protection.

Storage	Store in a cool, dry place. Do not store in direct sunlight. Keep container closed when not in use. Do not expose to air. Store protected from moisture. Store protected from light. Store under an inert atmosphere.
Handling	Wash hands before eating. Avoid contact with eyes. Avoid ingestion and inhalation. Store protected from light. Handle under an inert atmosphere. Store protected from air. Do not allow contact with water. Keep from contact with moist air and steam.
Protection	Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166. Skin: Protective garments not normally required. Clothing: Wear appropriate protective clothing to minimize contact with skin.
Respirators	Follow the OSHA respirator regulations found in 29CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.
Small spills/leaks	Clean up spills immediately, using the appropriate protective equipment. Sweep up, then place into a suitable container for disposal. Avoid generating dusty conditions. Provide ventilation. Place under an inert atmosphere. Do not get water inside containers.
Stability	Stable under normal temperatures and pressures.
Incompatibilities	Strong oxidizing agents.
Decomposition	Nitrogen oxides, carbon monoxide, oxides of nitrogen, oxides of sulfur, irritating and toxic fumes and gases, carbon dioxide, nitrogen.

Fire.

Fire fighting	Wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. To extinguish fire, use water, dry chemical, chemical foam, or alcohol-resistant foam. Use agent most appropriate to extinguish fire. Do NOT get water inside containers.
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Health.

Poison_Class 4

Exposure effects

Ingestion Ingestion of large amounts may cause gastrointestinal irritation. May be harmful if swallowed.

Inhalation May cause respiratory tract irritation.

Skin May cause skin irritation.

Eyes May cause eye irritation.

First aid

Ingestion Do NOT induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid if irritation or symptoms occur.

Inhalation Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Skin Get medical aid if irritation develops or persists. Wash clothing before reuse. Flush skin with plenty of soap and water.

Eyes Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. If irritation develops, get medical aid.

Transportation.

HS Code 2930 90 12

Material Safety Data Sheet

L-Cystine

ACC# 12377

Section 1 - Chemical Product and Company Identification

MSDS Name: L-Cystine

Catalog Numbers: AC111800000, AC111801000, BP377-100, BP377100LC

Synonyms: L(-)-3,3'-Dithiobis(2-aminopropanoic acid)

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
56-89-3	L-Cystine	99	200-296-3

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white crystalline powder.

Warning! Harmful if swallowed. Causes eye, skin, and respiratory tract irritation.

Target Organs: Respiratory system, eyes, skin.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Causes skin irritation. May be harmful if absorbed through the skin.

Ingestion: Harmful if swallowed. May cause irritation of the digestive tract.

Inhalation: Causes respiratory tract irritation. May be harmful if inhaled.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: Get medical aid immediately. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If breathing is difficult, give oxygen. Get medical aid. Do not use mouth-to-mouth resuscitation if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 1; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container.

Clean up spills immediately, observing precautions in the Protective Equipment section.

Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation.

Storage: Store in a cool, dry place. Store in a tightly closed container.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
L-Cystine	none listed	none listed	none listed

OSHA Vacated PELs: L-Cystine: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Crystalline powder

Appearance: white

Odor: none reported

pH: Not available.

Vapor Pressure: Negligible.

Vapor Density: Not available.

Evaporation Rate: Negligible.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 260 - 261 deg C (decom)

Decomposition Temperature: 260 - 261 deg C

Solubility: 0.112 g/l @ 25°C

Specific Gravity/Density: Not available.

Molecular Formula: C₆H₁₂N₂O₄S₂

Molecular Weight: 240.29

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, dust generation.

Incompatibilities with Other Materials: Strong oxidizing agents.

Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, oxides of sulfur, carbon dioxide.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 56-89-3: HA2690000

LD50/LC50:

CAS# 56-89-3:

Oral, mouse: LD50 = 156 mg/kg;

Carcinogenicity:

CAS# 56-89-3: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information available.

Physical: No information available.

Other: Do not empty into drains.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.
RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not Regulated.	Not Regulated.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 56-89-3 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 56-89-3 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XN

Risk Phrases:

R 22 Harmful if swallowed.

R 36/37/38 Irritating to eyes, respiratory system and skin.

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 37/39 Wear suitable gloves and eye/face protection.

WGK (Water Danger/Protection)

CAS# 56-89-3: 0

Canada - DSL/NDSL

CAS# 56-89-3 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List