

## Alistair MacDonald

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**From:** David Swisher [dswisher@tamerlaneventures.com]  
**Sent:** September 10, 2007 9:54 AM  
**To:** Alistair MacDonald  
**Cc:** 'Rick Hoos'; 'David Swisher'  
**Subject:** RE: Remaining 2nd Round IR Responses

Good morning Al,

Please see the following:

- Calculated flood levels
  - Calculated from the Flood Risk Map for the Hay River Area, the rail loadout area lies between contours 172.5 & 172.0. The DFL (design flood level) for the rail loadout area is at 172.3. Accordingly, Flood proofing requires raising of structures above this elevation. Any wooden substructure must be a minimum of .3m above the DFL and floor elevations a minimum of .5m above the DFL. Tamerlane's proposed rail loadout facility will be concrete foundation and walls and will be constructed ~ 1.0m above the DFL.
- (Final Analysis Attached) Basal inflow analysis (currently being reviewed and recalculated by EBA hydrogeologist)
- (Attached) Injection well picture
- (Attached) Injection well usage locations
- (Attached) MSDS sheets for reagents

Thanks,

**David Swisher**  
**Vice President / Senior Project Manager**  
**Tamerlane Ventures Inc.**  
**441 Peace Portal Drive**  
**Blaine, WA 98247**  
**Wk: 360.332.4653**  
**Cell: 867.875.7449**  
**Fax: 360.332.4652**  
**Email: dswisher@tamerlaneventures.com**

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**From:** David Swisher [mailto:dswisher@tamerlaneventures.com]  
**Sent:** Thursday, August 30, 2007 2:38 PM  
**To:** Alistair MacDonald  
**Cc:** Rick Hoos; David Swisher  
**Subject:** Remaining 2nd Round IR Responses

Hello Al,

Please see the attached final second round IR responses along with the modified DAR summary report. Any changes in the summary report are in green font. I'm also working on some points of clarification surrounding the following:

- Calculated flood levels

13/09/2007

- Basal inflow analysis (currently being reviewed and recalculated by EBA hydrogeologist)
- Injection well picture
- Injection well usage locations
- MSDS sheets for reagents

If you have any questions, please don't hesitate to call me.

Thanks,

**David Swisher**  
**Vice President / Senior Project Manager**  
**Tamerlane Ventures Inc.**  
**441 Peace Portal Drive**  
**Blaine, WA 98247**  
**Wk: 360.332.4653**  
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**Email: [dswisher@tamerlaneventures.com](mailto:dswisher@tamerlaneventures.com)**

# Material Safety Data Sheet

## Sodium Sulfate Anhydrous

ACC# 21630

### Section 1 - Chemical Product and Company Identification

**MSDS Name:** Sodium Sulfate Anhydrous

**Catalog Numbers:** S78859, S78859-1, S80193, BP354-500, FLS421-50LC, NC9054981, NC9084721, NC9517838, NC9518024, NC9569761, NC9581693, NC9614498, NC9671081, NC9727361, NC9797115, NC9862315, NC9868791, NC9956252, S415-1, S415-10, S415-10S, S415-200LB, S415-212, S415-3, S415-500, S415J500, S418-212, S418-500, S420-10, S420-3, S421-1, S421-10, S421-3, S421-300LB, S421-50, S421-500, S42150LC, S429-12, S429-212, S429-250LB, S429-500, S43112, S43412, S78859-4, SSX421PD100LB, XXNASULSM200, XXNASULSM50K, XXS41510KG, XXS415ET2.5K, XXS415MB200L, XXS415MN200L, XXS421PD100L, XXS429PD100LB, XXSODSULFSM1

**Synonyms:** Bisodium sulfate; Dibasic sodium sulfate; Disodium monosulfate; Disodium sulfate; Natriumsulfate; Sodium sulphate; Sulfuric acid, disodium salt; Thenardite

**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
7757-82-6	Sodium sulfate	ca.100	231-820-9

**Hazard Symbols:** None listed.

**Risk Phrases:** None listed.

### Section 3 - Hazards Identification

#### EMERGENCY OVERVIEW

Appearance: white powder. **Caution!** Moisture sensitive. This is expected to be a low hazard for usual industrial handling. May cause eye and skin irritation. May cause respiratory and digestive

tract irritation. May cause fetal effects based upon animal studies.

**Target Organs:** No data found.

### Potential Health Effects

**Eye:** May cause eye irritation.

**Skin:** May cause skin irritation.

**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. 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:** 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. This material in sufficient quantity and reduced particle size is capable of creating a dust explosion.

**Extinguishing Media:** Substance is nonflammable; use agent most appropriate to extinguish surrounding fire. Do NOT get water inside containers.

**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 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 get water inside containers.

## Section 7 - Handling and Storage

**Handling:** Wash thoroughly after handling. Wash hands before eating. Remove contaminated clothing and wash before reuse. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation. Use with adequate ventilation. Do not allow contact with water. Keep from contact with moist air and steam.

**Storage:** Keep from contact with oxidizing materials. Store in a cool, dry, well-ventilated area away from incompatible substances. Do not store in aluminum containers. 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
Sodium sulfate	none listed	none listed	none listed

**OSHA Vacated PELs:** Sodium 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 a respirator's use.

## Section 9 - Physical and Chemical Properties

**Physical State:** Powder

**Appearance:** white

**Odor:** odorless

**pH:** 4.9 (5% solution)

**Vapor Pressure:** Not available.  
**Vapor Density:** Not available.  
**Evaporation Rate:** Not available.  
**Viscosity:** 2.48 (22% soln)  
**Boiling Point:** 1100 deg C (dec)  
**Freezing/Melting Point:** 880-888 deg C  
**Decomposition Temperature:** Not available.  
**Solubility:** Soluble in cold water.  
**Specific Gravity/Density:** 2.671  
**Molecular Formula:** Na<sub>2</sub>SO<sub>4</sub>  
**Molecular Weight:** 142.0372

## 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, dust generation, moisture, excess heat.

**Incompatibilities with Other Materials:** Strong oxidizing agents, aluminum, magnesium, potassium, mercury, lead, calcium, silver, barium, ammonium ions, strontium.

**Hazardous Decomposition Products:** Oxides of sulfur, irritating and toxic fumes and gases, sodium oxide.

**Hazardous Polymerization:** Will not occur.

## Section 11 - Toxicological Information

**RTECS#:**

**CAS#** 7757-82-6: WE1650000

**LD50/LC50:**

CAS# 7757-82-6:

Oral, mouse: LD50 = 5989 mg/kg;

**Carcinogenicity:**

CAS# 7757-82-6: Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA.

**Epidemiology:** Subcutaneous, mouse: TDLo = 806 mg/kg/26W-I (Tumorigenic - equivocal tumorigenic agent by RTECS criteria - Skin and Appendages - tumors).

**Teratogenicity:** Oral, mouse: TDLo = 14 gm/kg (female 8-12 day(s) after conception) Effects on Newborn - other neonatal measures or effects.; Parenteral, mouse: TDLo = 60 mg/kg (female 8 day(s) after conception) Effects on Embryo or Fetus - fetotoxicity (except death, e.g., stunted fetus) and Specific Developmental Abnormalities - musculoskeletal system.

**Reproductive Effects:** No information available.

**Neurotoxicity:** No information available.

**Mutagenicity:** Tumorigenic: Subcutaneous, mouse: TDLo = 806 mg/kg/26wks (Skin and appendage tumors).

**Other Studies:** See actual entry in RTECS for complete information.

## Section 12 - Ecological Information

**Ecotoxicity:** Fish: Bluegill/Sunfish: LC50 = 12,750 ppm; 96 Hr; Static bioassay flea Daphnia: LC50 = 4547 mg/L; 96 Hr; Unspecified Fathead Minnow: LC50 = 13,500-14,000 mg/L; 24 - 96 Hr; Unspecified Mosquito Fish: LC50 = 17,500 mg/L; 96 Hr; Unspecified This chemical is not expected to cause oxygen depletion in aquatic systems. It has a low potential to affect aquatic organisms and is expected to have a low potential to affect secondary waste treatment microorganisms.

**Environmental:** Sodium sulfate may persist indefinitely in the environment, but is not likely to show bioaccumulation or food chain contamination effects. If diluted with water, this chemical released directly or indirectly into the environment is not expected to have a significant impact.

**Physical:** No information available.

**Other:** This chemical is not likely to bioconcentrate.

## 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
<b>Shipping Name:</b>	No information available.				No information available.
<b>Hazard Class:</b>					
<b>UN Number:</b>					
<b>Packing Group:</b>					

## Section 15 - Regulatory Information

### US FEDERAL

## **TSCA**

CAS# 7757-82-6 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.

## **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 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# 7757-82-6 can be found on the following state right to know lists: 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:**

Not available.

#### **Risk Phrases:**

#### **Safety Phrases:**

### **WGK (Water Danger/Protection)**

CAS# 7757-82-6: 0

### **Canada - DSL/NDSL**

CAS# 7757-82-6 is listed on Canada's DSL List.

### **Canada - WHMIS**

This product does not have a WHMIS classification.

### **Canadian Ingredient Disclosure List**

### **Exposure Limits**



## Section 16 - Additional Information

**MSDS Creation Date:** 7/15/1999

**Revision #3 Date:** 3/18/2003

*The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.*





## MATERIAL SAFETY DATA

MSDS No: 03480  
Date: 06/25/1999  
Supersedes: 07/01/1997

### 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: **AERO<sup>+</sup> 3894 Promoter**

SYNONYMS: None

CHEMICAL FAMILY: Thionocarbamate

MOLECULAR FORMULA: Mixture

MOLECULAR WGT: Mixture

USE: Mining Chemicals

MANUFACTURED BY: CYTEC INDUSTRIES INC., FIVE GARRET MOUNTAIN PLAZA,  
WEST PATERSON, NEW JERSEY 07424, USA - 973/357-3100

SUPPLIED BY: CYTEC CANADA INC., GARNER ROAD, P.O. BOX 240,  
NIAGARA FALLS, ONTARIO, CANADA L2E 6T4 1-905/356-9000

EMERGENCY PHONE: In CANADA: 905/356-8310 In USA: 1-800/424-9300 or 1-703/527-3887.

+Trademark or registered Trademark

### 2. COMPOSITION/INFORMATION ON INGREDIENTS

#### WHMIS REGULATED COMPONENTS

COMPONENT	CAS. NO.	%(w/w)	TWA/CEILING	REFERENCE
Isopropanol	000067-63-0	1-3	400 ppm 500 ppm STEL	OSHA/ACGIH ACGIH

### 3. HAZARDS IDENTIFICATION

#### EMERGENCY OVERVIEW

APPEARANCE AND ODOR: Pale yellow to reddish mobile liquid; pungent odor

#### STATEMENTS OF HAZARD:

CAUTION! MAY CAUSE EYE AND SKIN IRRITATION  
COMBUSTIBLE LIQUID AND VAPOR

#### POTENTIAL HEALTH EFFECTS

##### EFFECTS OF EXPOSURE:

The estimated acute oral (rat) LD50, acute dermal (rabbit) LD50 and 4-hour inhalation LC50 (rat) values for this material are >5,000 mg/kg, >2,000 mg/kg and >2,500 ppm, respectively.

Direct contact with this material may cause mild eye and skin irritation.

Refer to Section 11 for toxicology information on the WHMIS regulated components of this product.

### 4. FIRST AID MEASURES

Material is not expected to be harmful by ingestion. No specific first aid measures are required.

In case of skin contact, wash affected areas of skin with soap and water.

In case of eye contact, immediately irrigate with plenty of water for 15 minutes.

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## 5. FIRE FIGHTING MEASURES

### FLAMMABLE PROPERTIES

FLASH POINT: 120 F; 49 C

METHOD: Tag Closed Cup

### FLAMMABLE LIMITS

(% BY VOL): Not applicable

AUTOIGNITION TEMP: Not available

DECOMPOSITION TEMP: 392 F; 200 C

MECHANICAL/STATIC SENSITIVITY: None

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### EXTINGUISHING MEDIA AND FIRE FIGHTING INSTRUCTIONS

Use water spray, alcohol foam, carbon dioxide or dry chemical to extinguish fires. Water stream may be ineffective. Use water to keep containers cool. Wear self-contained, positive pressure breathing apparatus.

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## 6. ACCIDENTAL RELEASE MEASURES

### STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Remove sources of ignition.

Where exposure level is not known, wear NIOSH approved, positive pressure, self-contained respirator. Where exposure level is known, wear NIOSH approved respirator suitable for level of exposure. In addition to the protective clothing/equipment in Section 8 (Exposure Controls Personal Protection), wear impervious boots.

Cover spills with some inert absorbent material; sweep up and place in a waste disposal container. Flush area with water.

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## 7. HANDLING AND STORAGE

Keep away from heat and flame. Avoid contact with eyes, skin, and clothing. Wash thoroughly after handling.

Avoid contact with brass or copper, explosive amides may be formed.

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## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

### ENGINEERING CONTROLS AND PERSONAL PROTECTIVE EQUIPMENT (PPE)

Engineering controls are not usually necessary if good hygiene practices are followed. Before eating, drinking, or smoking, wash face and hands thoroughly with soap and water. Avoid unnecessary skin contact. Impervious gloves and apron are recommended to prevent skin contact. For operations where eye or face contact can occur, wear eye protection such as chemical splash-proof goggles or face shield. Where exposures are below the Permissible Exposure Limit (PEL), no respiratory protection is required. Where exposures exceed the PEL, use respirator approved by NIOSH for the material and level of exposure. See "GUIDE TO INDUSTRIAL RESPIRATORY PROTECTION" (NIOSH).

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## 9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AND ODOR: Pale yellow to reddish mobile liquid; pungent odor

BOILING POINT: 392 F; 200 C; (decomposes)

MELTING POINT: Not applicable

VAPOR PRESSURE: Not available

SPECIFIC GRAVITY: 1.004

VAPOR DENSITY: >1; (air = 1)

% VOLATILE (BY WT): 100

pH: Not applicable

SATURATION IN AIR (% BY VOL): Not available

EVAPORATION RATE: Not available

SOLUBILITY IN WATER: Negligible

ODOR THRESHOLD: See section 2 for permissible exposure limits.

## 10. STABILITY AND REACTIVITY

STABILITY: Stable

CONDITIONS TO AVOID: None known

POLYMERIZATION: Will Not Occur

CONDITIONS TO AVOID: None known

INCOMPATIBLE MATERIALS: Strong oxidizing agents

HAZARDOUS DECOMPOSITION/ COMBUSTION PRODUCTS: Thermal decomposition or combustion may produce carbon monoxide, carbon dioxide, oxides of sulfur and/or oxides of nitrogen.

## 11. TOXICOLOGICAL INFORMATION

Toxicological information for the product is found under Section 3. HAZARDS IDENTIFICATION. Toxicological information on the WHMIS regulated components of this product is as follows:

Isopropanol has acute oral (rat) and dermal (rabbit) LD50 values of 5.0 g/kg and 12.8 g/kg, respectively. The 4-hour inhalation LC50 (rat) for isopropanol is >16,000 ppm (40.86 mg/L). Acute overexposure to isopropanol vapor may cause mild irritation of the eyes and respiratory tract. Chronic overexposure to isopropanol vapors may cause central nervous system depression, headaches, dizziness, nausea, and staggered gait. Liquid isopropanol is a severe eye irritant.

## 12. ECOLOGICAL INFORMATION

No aquatic LC50, BOD, or COD data available.

OCTANOL/H<sub>2</sub>O PARTITION COEF.: Not available

## 13. DISPOSAL CONSIDERATIONS

Cytec encourages the recycle, recovery and reuse of materials, where permitted, as an alternative to disposal as a waste. Cytec recommends that organic materials classified as hazardous waste according to the relevant local or national regulations be disposed of by thermal treatment or incineration at approved facilities. All local and national regulations should be followed.

## 14. TRANSPORT INFORMATION

This section provides basic shipping classification information. Refer to appropriate transportation regulations for specific requirements.

	TRANSPORT CANADA	ICAO/IATA
SHIPPING NAME:	FLAMMABLE LIQUID, N.O.S.	FLAMMABLE LIQUID, N.O.S.
HAZARD CLASS:	3	3
SUBSIDIARY CLASS:	—	—
UN / ID NUMBER:	1993	1993
PACKING GROUP:	III	III

TRANSPORT LABEL REQUIRED:	Flammable Liquid	Flammable Liquid
PACKING INSTR:	Not Applicable	PASSENGER 309 CARGO 310
MAX NET QTY:	Not Applicable	PASSENGER 60L CARGO 220L
SHIPPING NAME:	<b>D.O.T. SHIPPING INFORMATION</b> FLAMMABLE LIQUID, N.O.S.	<b>IMO SHIPPING INFORMATION</b> FLAMMABLE LIQUID, N.O.S.
HAZARD CLASS/ PACKING GROUP:	3 III	3.3 III
UN NUMBER:	UN1993	1993
IMDG PAGE:	Not Applicable	3345
D.O.T. HAZARDOUS SUBSTANCES:	(PRODUCT REPORTABLE QUANTITY) Not Applicable	Not Applicable
TRANSPORT LABEL REQUIRED:	Flammable Liquid	Flammable Liquid

#### ADDITIONAL TRANSPORT INFORMATION

TECHNICAL NAME (N.O.S.): (Contains isopropanol)

## 15. REGULATORY INFORMATION

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and this Material Safety Data Sheet contains all the information required by the Controlled Products Regulations.

**WHMIS CLASSIFICATION:** CLASS B DIVISION 3 COMBUSTIBLE LIQUID

### INVENTORY INFORMATION

- CANADA DSL:** Components of this product have been reported to Environment Canada in accordance with subsection 25 of the Canadian Environmental Protection Act and are included on the Domestic Substances List.
- US TSCA:** All components of this product are included on the TSCA Inventory in compliance with the Toxic Substances Control Act, 15 U. S. C. 2601 et. seq.  
This product contains a chemical substance that is subject to export notification under Section 12 (b) of the Toxic Substances Control Act, 15 U. S. C. 2601 et. seq. (This requirement applies to exports from the United States only.)
- EEC EINECS:** All components of this product are included in the European Inventory of Existing Chemical Substances (EINECS) in compliance with Council Directive 67/548/EEC and its amendments.

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## 16. OTHER INFORMATION

### NFPA HAZARD RATING (National Fire Protection Association)

Fire	2	FIRE: Materials that must be moderately heated or exposed to relatively high ambient temperatures before ignition can occur.
Health	1	HEALTH: Materials which on exposure would cause irritation but only minor residual injury even if no treatment is given.
Reactivity	0	REACTIVITY: Materials which in themselves are normally stable, even under fire exposure conditions, and which are not reactive with water.
Special	—	

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### REASON FOR ISSUE:

Revised Section 10

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Randy Deskin, Ph.D., DABT  
Cytex Industries Inc.: 973/357-3100

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This information is given without any warranty or representation. We do not assume any legal responsibility for same, nor do we give permission, inducement, or recommendation to practice any patented invention without a license. It is offered solely for your consideration, investigation and verification. Before using any product, read its label.

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P.O. Box 9  
DK-7620 Lemvig  
Denmark

Phone (+45) 96 90 96 90  
Fax (+45) 96 90 96 91  
www.cheminova.com  
CVR-No. DK 12 76 00 43

Product No.: 045  
Product Name: DANAFLOAT™ 067

Active Ingredient: Cresyl-dtp-NH<sub>4</sub>

MVF/May 2001  
(Review of GHB/October 1998 - no corrections inserted)

Supersedes issue marked GHB/May 1998

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## MATERIAL SAFETY DATA SHEET

# DANAFLOAT™ 067

### Table of Contents:

- |   |                                     |
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| 1. Identification of the substance/preparation and of the company/undertaking | 9. Physical and chemical properties |
| 2. Composition/information on ingredients                                     | 10. Stability and reactivity        |
| 3. Hazards identification   | 11. Toxicological information       |
| 4. First aid measures   | 12. Ecological information          |
| 5. Fire-fighting measures   | 13. Disposal considerations         |
| 6. Accidental release measures  | 14. ♣ Transport information         |
| 7. Handling and storage   | 15. ♣ Regulatory information        |
| 8. Exposure controls/personal protection                                      | 16. Other information               |

Revisions: Sections containing a revision or new information are marked with a ♣.

### 1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING



Toxic

Product Name:

**DANAFLOAT™ 067**

Manufacturer: **CHEMINOVA AGRO A/S**  
P.O. Box 9  
DK-7620 Lemvig  
Denmark

Emergency Telephone No. (+45) 97 83 53 53

### 2. COMPOSITION/INFORMATION ON INGREDIENTS

#### 2.1. ACTIVE INGREDIENT:

CAS Name .....	Phosphorodithioic acid, O,O-bis(methylphenyl) ester, ammonium salt
Other Names .....	Ammonium O,O-bis(methylphenyl) dithiophosphate Ammonium-O,O-bis(methylphenyl)phosphorodithioate <b>Cresyl-dtp-NH<sub>4</sub></b>
CAS No. ....	58373-83-4
EC No. (EINECS No.) .....	261-229-1
Index No. ....	-
Molecular Weight .....	327,40
Empirical Formula .....	C <sub>14</sub> H <sub>18</sub> NO <sub>2</sub> PS <sub>2</sub>



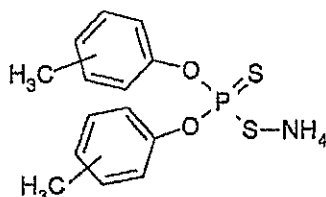
Cheminova A/S  
P. O. Box 9  
DK-7620 Lemvig  
Denmark

Phone (+45) 96 90 96 90  
Fax (+45) 96 90 96 91  
www.cheminova.com  
CVR-No. DK1276 00 43

Product No.: 045  
Product Name: DANAFLOAT™ 067  
Active Ingredient: Cresyl-dtp-NH<sub>4</sub>

MVF/May 2001  
(Review of GHB/October 1998 - no corrections inserted)  
Supersedes issue marked GHB/May 1998  
Page 2 of 6

Structural Formula .....



EU Classification ..... Xn;R21/22 C;R34: Harmful in contact with skin and if swallowed. Causes burns.

2.2. Typical Content:

Active Ingredient .....	Cresyl-dtp-NH <sub>4</sub> .....	49-51 % by weight
Other Ingredients .....	Cresols .....	4-8 % by weight
	Water .....	ad 100 % by weight

EU classification Cresol: T;R24/25 C;R34: Toxic in contact with skin and if swallowed. Causes burns.

2.3. EU Classification of the Product ..... T;R24/25 C;R34

2.4. Material Use ..... Flotation reagent (flotation collector)

**3. HAZARDS IDENTIFICATION**

Little is known about the health hazards of the active ingredient Cresyl-dtp-NH<sub>4</sub>. It is assumed to be harmful and corrosive, based on analogy to similar substances. However, the product contains 4-8% cresols which are considered to be the most toxic compounds in the product. Below the health hazards of cresols are described.

3.1. Health Hazards (Acute and Chronic) Cresols are poisonous and can cause severe irritation on contact with skin and eyes, and to mucous membranes of the respiratory tract. It can cause permanent damage, in-depth burns and blindness. It enters the body on contact with all skin surfaces, eyes, and by inhalation. It attacks the central nervous system, respiratory tract, liver and kidneys. After severe contamination death can rapidly occur.

Long range effects include permanent damage to tissues, most often skin, lungs, central nervous system, liver and kidneys.

Hypersensitivity develops in certain individuals.

It should be noted that permanent damage to health may already occur before the smell threshold is crossed. Moreover, the amount of pain experienced on exposure is no measure for the actual damage. Long range effects may be more severe.

3.2. Signs and Symptoms of Exposure ..... Burning pain in nose, mouth, eyes and skin, nausea, headache, vomiting, convulsions, tightness in chest, laboured breathing, unconsciousness, cardiac arrest.



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Denmark

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Fax (+45) 96 90 96 91  
www.cheminova.com  
CVR-No. DK 12 76 00 43

Product No.: 045  
Product Name: DANAFLOAT™ 067

Active Ingredient: Cresyl-dtp-NH<sub>4</sub>

MVF/May 2001  
(Review of GHB/October 1998 - no corrections inserted)  
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3.3. Environmental Hazards ..... See 12.

**4. FIRST AID MEASURES**

Emergency and First Aid Procedures **In case of contact with skin or eyes, immediately flush eyes or skin with plenty of water while removing contaminated clothing and shoes. See physician immediately.**

**If swallowed, avoid making the exposed person vomit. Rinse mouth. Have the exposed person take a few spoonfuls of food oil (olive oil or other plant oil, no paraffin oil). Never give anything by mouth to an unconscious person. Make the exposed person sit in half-upright position and keep him/her steady. Get medical attention immediately. Explain that the victim has been exposed to Cresol and describe his/her condition. Move the exposed person from the area where Cresol is present.**

**If breathing has stopped, start artificial respiration immediately and maintain until physician takes care of victim.**

**5. FIRE-FIGHTING MEASURES**

5.1. Extinguishing Media and Procedure **Dry chemical or carbon dioxide for small fires, water spray or foam for large fires.**

**Use water spray to keep fire-exposed containers cool. Approach fire from upwind to avoid hazardous vapours and toxic decomposition products. Fight fire from protected location or maximum possible distance. Avoid heavy hose streams. Dike area to prevent water runoff. Firemen should wear self-contained breathing apparatus and protective clothing.**

5.2. Hazardous Decomposition or ..... **The essential breakdown products are volatile, toxic, malodorous and inflammable compounds such as hydrogen sulfide, sulfur dioxide, nitrogen oxides and phosphorus pentoxide but only after Byproducts in a Fire water content has evaporated.**

5.3. Unusual Fire and Explosion Hazards -

**6. ACCIDENTAL RELEASE MEASURES**

6.1. Personal Protection ..... **Observe all protection and safety precautions when cleaning up spills, see 8.**

6.2. Steps to Be Taken in Case of Spill **Spills should be contained and swept up by means of an inert absorptive material such as hydrated lime, sawdust, Fuller's earth or other absorbent clays. Scoop into proper containers and arrange for removal by a licensed contractor. Rinse area with strong industrial detergent.**



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MVF/May 2001  
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## 7. HANDLING AND STORAGE

- 7.1. Precautions to Be Taken in Handling See Personal Protection, Section 8.
- 7.2. Precautions to Be Taken in Storing To avoid freezing, store wherever possible above 5°C.
- 7.3. Fire and Explosion Precautions ..... -

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

- 8.1. Respiratory Protection ..... Avoid inhalation of vapours, if required by using a respirator in conformity with local regulations.
- Protective Gloves ..... Wear chemical resistant gloves, such as barrier laminate, butyl rubber, nitrile rubber or viton.
- Eye Protection ..... Wear safety glasses. Have eye baths immediately available when there is a potential for eye contact.
- Other Protection ..... Wear protective clothing.
- 8.2. Work/Hygienic Practices ..... Before removing gloves, wash them with soap and water. Always wash hands, face and arms with soap and water before smoking, eating or drinking.
- After work, take off all work clothes and shoes. Shower, using soap and water. Wear only clean clothes when leaving job. Do not wear contaminated clothing/protective equipment.  
Respirator should be cleaned and filter replaced according to instructions provided with respirator.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

- 9.1. Physical State ..... Liquid (aqueous solution)
- 9.2. Colour ..... Red/brown
- 9.3. Odour ..... Tar-like
- 9.4. Melting/Freezing Point ..... -1 to -5°C
- 9.5. Boiling Point ..... > 100°C
- 9.6. Specific Gravity ..... 1.14 g/ml
- 9.7. Solubility in Water ..... Miscible
- 9.8. pH ..... 9.0-10.5
- 9.9. Flash Point ..... None. The flame is extinguished at 65°C in the Pensky-Martens closed tester.
- 9.10. Autoignition Temperature ..... Not available
- 9.11. Flammable Limits ..... Not available

## 10. STABILITY AND REACTIVITY

- 10.1. Thermal Decomposition ..... Stable at ambient temperatures



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- 10.2. Hazardous Decomposition or Byproducts ..... See 5.2.  
10.3. Materials to Avoid ..... Strong oxidants

**11. TOXICOLOGICAL INFORMATION**

- 11.1. Health Hazards ..... See 3.1.  
11.2. Route(s) of Entry - Ingestion LD<sub>50</sub> cresols, oral, rat: 121-242 mg/kg  
- Skin LD<sub>50</sub> cresols, dermal, rabbit: 301-2050 mg/kg  
- Inhalation -  
11.3. Irritancy of Material ..... Cresols are corrosive/severely irritant to eyes and skin.

**12. ECOLOGICAL INFORMATION**

The product is biodegradable at low concentrations. It undergoes degradation in the environment and in waste water treatment plants. Degradation occurs both aerobically and anaerobically.

In the environment, cresols are degraded (but only at low concentrations), especially by bacteria that are widely distributed in the soil and water, particularly *Pseudomonas* species. Degradation by other organisms, including yeasts, fungi, algae, and higher plants, as well as by photolysis, is also known. Accordingly, cresols do not persist in the environment at low concentrations.

Cresols show high acute toxicity both towards fish (96 h-LC<sub>50</sub>, 1-10 mg cresol/liter) and to aquatic invertebrates. They impair the taste of edible fish and drinking water even in very low concentrations.

**13. DISPOSAL CONSIDERATIONS**

- 13.1. Waste Disposal Method ..... Spill and waste disposal procedures in conformity with state and local regulations must be followed.  
  
Do not contaminate water, food or feed by storage or disposal.  
13.2. Container Disposal ..... Triple rinse (or equivalent). Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill. However, procedures in conformity with state and local regulations must be followed.

**14. TRANSPORT INFORMATION**

**UN CLASSIFICATION:**

Proper Shipping Name ..... Toxic Liquid, Corrosive, Organic, N.O.S. (Contains Cresols)  
No. .... 2927  
Class ..... 6.1  
Packaging Group ..... II  
Primary Hazard ..... Toxic  
Subsidiary Risk ..... 8  
Marine Pollutant (P/PP) ..... -  
(IMDG-Code)

Product No.: 045  
Product Name: DANAFLOAT™ 067

Active Ingredient: Cresyl-dtp-NH<sub>4</sub>

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## 15. \* REGULATORY INFORMATION

### 15.1. IN THE EU:

Classification and Labelling  
(according to 88/379/EEC as amended)

Danger Symbol .....



Contains ..... Cresols, Ammonium O,O-bis(methylphenyl) dithiophosphate

R-Phrases ..... R24/25-34: Toxic in contact with skin and if swallowed. Causes burns.

S-Phrases ..... S26-36/37/39-45: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear suitable protective clothing, gloves and eye/face protection. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

15.2. Threshold Limit Value .....	OSHA (USA) PEL-TWA	ACGIH (USA) TLV-TWA	MAK (Germany)	HGV (Denmark)
* Cresols (all isomers)	5 ppm skin	5 ppm skin	5 ppm skin	5 ppm skin

However, threshold limit values defined by local regulations must be observed.

## 16. OTHER INFORMATION

# 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:** 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

**Hazard Symbols:** XN N

**Risk Phrases:** 22 36/38 50/53

### Section 3 - Hazards Identification

#### EMERGENCY OVERVIEW

Appearance: light gray powder. Hygroscopic. **Warning!** Harmful if swallowed. Causes eye and skin irritation and possible burns. Causes digestive and respiratory tract irritation with possible burns. 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 soap and 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 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	none listed	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 a respirator's 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, rat: LD50 = 300 mg/kg;

**Carcinogenicity:**

CAS# 7758-98-7: Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA.

**Epidemiology:** No information found.

**Teratogenicity:** See actual entry in RTECS for complete information.

**Reproductive Effects:** See actual entry in RTECS for complete information.

**Neurotoxicity:** No information available.

**Mutagenicity:** See actual entry in RTECS for complete information.

**Other Studies:** No information available.

## Section 12 - Ecological Information

**Ecotoxicity:** Fish: Rainbow trout: LC50 = 0.1-2.5 mg/L; 96 Hr; Unspecified Bluegill/Sunfish: LC50 = 0.6 mg/L; 48 Hr; 15 mg/L CaCO<sub>3</sub> Bluegill/Sunfish: LC50 = 8.0 mg/L; 48 Hr; 68 mg/L CaCO<sub>3</sub> Bluegill/Sunfish: LC50 = 10.0 mg/L; 48 Hr; 100 mg/L CaCO<sub>3</sub> Bluegill/Sunfish: LC50 = 45.0 mg/L; 48 Hr; 132 mg/L CaCO<sub>3</sub> 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	IATA	RID/ADR	IMO	Canada TDG
<b>Shipping Name:</b>	No information available.				No information available.
<b>Hazard Class:</b>					
<b>UN Number:</b>					
<b>Packing Group:</b>					

## 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.

#### SARA

#### Section 302 (RQ)

CAS# 7758-98-7: final RQ = 10 pounds (4.54 kg)

#### Section 302 (TPQ)

None of the chemicals in this product have a TPQ.

#### SARA Codes

CAS # 7758-98-7: acute.

#### Section 313

This material contains Copper(II) sulfate (listed as Copper), 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 depleters. This material does not contain any Class 2 Ozone depleters.

#### 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. 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# 7758-98-7 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:

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/or 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.

### Canadian Ingredient Disclosure List

CAS# 7758-98-7 is listed on the Canadian Ingredient Disclosure List.

### Exposure Limits

CAS# 7758-98-7: OEL-ARAB Republic of Egypt:TWA 0.1 mg(Cu)/m3 (fume)  
OEL-AUSTRALIA:TWA 0.2 mg(Cu)/m3 (fume) OEL-AUSTRALIA:TWA 1 mg(Cu)/m3  
(dust) OEL-BELGIUM:TWA 0.2 mg(Cu)/m3 (fume) OEL-BELGIUM:TWA 1 mg(Cu)  
) /m3 (dust) OEL-DENMARK:TWA 0.1 mg(Cu)/m3 (fume) OEL-DENMARK:TWA 1 mg  
(Cu)/m3 (dust) OEL-FINLAND:TWA 0.2 mg(Cu)/m3 (fume) OEL-FINLAND:TWA  
1 mg(Cu)/m3 OEL-FINLAND:TWA 1 mg(Cu)/m3 (dust) OEL-FRANCE:TWA 0.2 m  
g(Cu)/m3 (fume) OEL-FRANCE:TWA 1 mg(Cu)/m3;STEL 2 mg(Cu)/m3 (dust OE  
L-GERMANY:TWA 0.1 mg(Cu)/m3 (fume) OEL-GERMANY:TWA 1 mg(Cu)/m3 OEL-G  
ERMANY:TWA 1 mg(Cu)/m3 (dust) OEL-HUNGARY:TWA 0.2 mg(Cu)/m3;STEL 0.4  
mg(Cu)/m3 (dust) OEL-INDIA:TWA 0.2 mg(Cu)/m3 (fume) OEL-THE NETHERLA  
NDS:TWA 0.2 mg(Cu)/m3 (fume) OEL-THE NETHERLANDS:TWA 1 mg(Cu)/m3 (dust  
) OEL-THE PHILIPPINES:TWA 1.0 mg(Cu)/m3 (fume) JAN9 OEL-POLAND:TWA 0  
.1 mg(Cu)/m3 (fume) OEL-RUSSIA:STEL 0.5 mg/m3 OEL-RUSSIA:STEL 0.5 pp  
m (1 mg(Cu)/m3) (dust) JAN9 OEL-SWEDEN:TWA 0.2 mg(Cu)/m3 (resp. dust)  
OEL-SWEDEN:TWA 0.2 mg(Cu)/m3 (fume) OEL-SWEDEN:TWA 1 mg(Cu)/m3 (tot  
al dust) OEL-SWITZERLAND:TWA 0.1 mg(Cu)/m3;STEL 0.2 mg(Cu)/m3 (fume)  
OEL-SWITZERLAND:TWA 1 mg(Cu)/m3;STEL 1 mg(Cu)/m3 OEL-THAILAND:TWA 0.  
1 mg(Cu)/m3 (fume) OEL-THAI

## Section 16 - Additional Information

**MSDS Creation Date:** 7/09/1999

**Revision #4 Date:** 4/23/2002

*The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.*



# Material Safety Data Sheet

The Dow Chemical Company

Product Name: DOWFROTH\* 250 A FLOTATION FROTHER

Issue Date: 2007.08.08

Print Date: 09 Aug 2007

The Dow Chemical Company encourages and expects you to read and understand the entire (M)SDS, as there is important information throughout the document. We expect you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

## 1. Product and Company Identification

### Product Name

DOWFROTH\* 250 A FLOTATION FROTHER

### COMPANY IDENTIFICATION

The Dow Chemical Company  
2030 Willard H. Dow Center  
Midland, MI 48674  
USA

For MSDS updates and Product Information: 800-258-2436

Prepared By: Prepared for use in Canada by EH&S, Product Regulatory  
Management Department.

450-652-1029

Revision 2007.08.08

Print Date: 8/9/2007

Customer Information Number: 800-258-2436

### EMERGENCY TELEPHONE NUMBER

24-Hour Emergency Contact: 989-636-4400

Local Emergency Contact: 519-339-3711

## 2. Hazards Identification

### Emergency Overview

Color: Yellow to brown

Physical State: Liquid

Odor: Mild

Hazards of product:

**DANGER!** Causes eye burns. May cause skin irritation. May cause anesthetic effects. May be harmful if swallowed. Isolate area. Keep upwind of spill.

\* Indicates a Trademark

**Potential Health Effects**

**Eye Contact:** Due to the pH of the material, it is assumed that exposure may cause severe irritation with corneal injury which may result in permanent impairment of vision, even blindness.

**Skin Contact:** Brief contact may cause skin irritation with local redness. Prolonged contact may cause skin irritation with local redness. Repeated contact may cause skin burns. Symptoms may include pain, severe local redness, swelling, and tissue damage. May cause more severe response if skin is abraded (scratched or cut). May cause more severe response on covered skin (under clothing, gloves).

**Skin Absorption:** Prolonged or repeated exposure to very large amounts of component(s) in this mixture may cause dizziness or drowsiness.

**Inhalation:** At room temperature, exposure to vapor is minimal due to low volatility; single exposure is not likely to be hazardous. If material is heated or aerosol/mist is produced, concentrations may be attained that are sufficient to cause respiratory irritation and other effects. Symptoms of excessive exposure may be anesthetic or narcotic effects; dizziness and drowsiness may be observed.

**Ingestion:** Low toxicity if swallowed. Small amounts swallowed incidentally as a result of normal handling operations are not likely to cause injury; however, swallowing larger amounts may cause injury. Observations in animals include: Tremors. Convulsions.

**Effects of Repeated Exposure:** Symptoms of excessive exposure may be anesthetic or narcotic effects; dizziness and drowsiness may be observed.

### 3. Composition/information on ingredients

Component	CAS #	Amount W/W
Polypropylene glycol monomethyl ether	37286-64-9	>= 98.0 %
Potassium Hydroxide	1310-58-3	<= 2.0 %
Dipropylene glycol monomethyl ether	34590-94-8	< 2.0 %
Water	7732-18-5	<= 1.0 %

Amounts are presented as percentages by weight.

### 4. First-aid measures

**Eye Contact:** Wash eyes immediately and continuously with water for 30 minutes. Remove contact lenses after the first 5 minutes and continue washing. Seek medical attention immediately, preferably from an ophthalmologist. Wash eyes en route if possible.

**Skin Contact:** Wash skin with plenty of water.

**Inhalation:** Move person to fresh air. If not breathing, give artificial respiration; if by mouth to mouth use rescuer protection (pocket mask, etc). If breathing is difficult, oxygen should be administered by qualified personnel. Call a physician or transport to a medical facility.

**Ingestion:** If swallowed, seek medical attention. Do not induce vomiting unless directed to do so by medical personnel.

**Notes to Physician:** Eye irrigation may be necessary for an extended period of time to remove as much caustic as possible. Duration of irrigation and treatment is at the discretion of medical personnel. Chemical eye burns may require extended irrigation. Obtain prompt consultation, preferably from an ophthalmologist. Maintain adequate ventilation and oxygenation of the patient. Attempt seizure control with diazepam 5-10 mg (adults) intravenous over 2-3 minutes. Repeat every 5-10 minutes as needed. Monitor for hypotension, respiratory depression, and need for intubation. Consider second agent if seizures persist after 30 mg. If seizures persist or recur administer phenobarbital 600-1200 mg (adults) intravenous diluted in 60 ml 0.9% saline given at 25-50 mg/minute. Evaluate for hypoxia, dysrhythmia, electrolyte disturbance, hypoglycemia (treat adults with dextrose 100 mg intravenous). If burn is present, treat as any thermal burn, after decontamination. No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

## 5. Fire Fighting Measures

**Extinguishing Media:** Water fog or fine spray. Dry chemical fire extinguishers. Carbon dioxide fire extinguishers. Foam. Do not use direct water stream. May spread fire. Alcohol resistant foams (ATC type) are preferred. General purpose synthetic foams (including AFFF) or protein foams may function, but will be less effective.

**Fire Fighting Procedures:** Keep people away. Isolate fire and deny unnecessary entry. Use water spray to cool fire exposed containers and fire affected zone until fire is out and danger of reignition has passed. Fight fire from protected location or safe distance. Consider the use of unmanned hose holders or monitor nozzles. Immediately withdraw all personnel from the area in case of rising sound from venting safety device or discoloration of the container. Burning liquids may be extinguished by dilution with water. Do not use direct water stream. May spread fire. Move container from fire area if this is possible without hazard. Burning liquids may be moved by flushing with water to protect personnel and minimize property damage.

**Special Protective Equipment for Firefighters:** Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves). Avoid contact with this material during fire fighting operations. If contact is likely, change to full chemical resistant fire fighting clothing with self-contained breathing apparatus. If this is not available, wear full chemical resistant clothing with self-contained breathing apparatus and fight fire from a remote location. For protective equipment in post-fire or non-fire clean-up situations, refer to the relevant sections.

**Unusual Fire and Explosion Hazards:** Container may rupture from gas generation in a fire situation. Violent steam generation or eruption may occur upon application of direct water stream to hot liquids.

**Hazardous Combustion Products:** During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating. Combustion products may include and are not limited to: Carbon monoxide. Carbon dioxide.

See Section 9 for related Physical Properties

## 6. Accidental Release Measures

**Steps to be Taken if Material is Released or Spilled:** Small spills: Absorb with materials such as: Sand. Vermiculite. Collect in suitable and properly labeled containers. Large spills: Contain spilled material if possible. Pump into suitable and properly labeled containers. See Section 13, Disposal Considerations, for additional information.

**Personal Precautions:** Isolate area. Refer to Section 7, Handling, for additional precautionary measures. Keep unnecessary and unprotected personnel from entering the area. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection. See Section 10 for more specific information.

**Environmental Precautions:** Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.

## 7. Handling and Storage

### Handling

**General Handling:** Do not get in eyes. Avoid breathing vapor. Avoid contact with skin and clothing. Wash thoroughly after handling. Keep container closed. Use with adequate ventilation. Spills of these organic materials on hot fibrous insulations may lead to lowering of the autoignition temperatures possibly resulting in spontaneous combustion. See Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION.

**Other Precautions:** Avoid contact with vapor from head space of containers.

### Storage

To avoid uncontrolled emissions, vent vapor from container to storage tank. Store in the following material(s): Carbon steel. Stainless steel. Phenolic lined steel drums. Do not store in: Aluminum. Copper. Galvanized iron. Galvanized steel. See Section 10 for more specific information.

## 8. Exposure Controls / Personal Protection

### Exposure Limits

Component	List	Type	Value
Potassium Hydroxide	OEL (QUE)	CEILING	2 mg/m3
			Exposure must be minimized.
	CAD AB OEL	CEILING	2 mg/m3
	CAD BC OEL	CEILING	2 mg/m3
	CAD ON OEL	CEILING	2 mg/m3
	ACGIH	Ceiling	2 mg/m3
	CAD MB OEL	Ceiling	2 mg/m3
	OEL (QUE)		Recirculation prohibited
Dipropylene glycol monomethyl ether	Dow IHG	TWA Aerosol	10 mg/m3
	CAD AB OEL	TWA	606 mg/m3 100 ppm SKIN
	CAD AB OEL	STEL	909 mg/m3 150 ppm SKIN
	CAD BC OEL	TWA	100 ppm SKIN
	CAD BC OEL	STEL	150 ppm SKIN
	CAD ON OEL	TWA	605 mg/m3 100 ppm
	CAD ON OEL	STEL	910 mg/m3 150 ppm
	ACGIH	TWA	100 ppm
	ACGIH	STEL	150 ppm SKIN
	OEL (QUE)	TWA	600 mg/m3 100 ppm
OEL (QUE)	STEL	900 mg/m3 150 ppm	

Consult local authorities for recommended exposure limits.

A "skin" notation following the exposure guideline refers to the potential for dermal absorption of the material including mucous membranes and the eyes either by contact with vapors or by direct skin contact.

It is intended to alert the reader that inhalation may not be the only route of exposure and that measures to minimize dermal exposures should be considered.

### Personal Protection

**Eye/Face Protection:** Use chemical goggles. Eye wash fountain should be located in immediate work area.

**Skin Protection:** Use protective clothing chemically resistant to this material. Selection of specific items such as face shield, boots, apron, or full body suit will depend on the task. Remove contaminated clothing immediately, wash skin area with soap and water, and launder clothing before reuse or dispose of properly.

**Hand protection:** Use gloves chemically resistant to this material. Examples of preferred glove barrier materials include: Butyl rubber. Polyethylene. Ethyl vinyl alcohol laminate ("EVAL"). Examples of acceptable glove barrier materials include: Viton. Neoprene. Natural rubber ("latex"). Polyvinyl chloride ("PVC" or "vinyl"). Nitrile/butadiene rubber ("nitrile" or "NBR"). NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.

**Respiratory Protection:** Atmospheric levels should be maintained below the exposure guideline. When respiratory protection is required for certain operations, use an approved air-purifying respirator. For most conditions, no respiratory protection should be needed; however, if material is heated or sprayed, use an approved air-purifying respirator. The following should be effective types of air-purifying respirators: Organic vapor cartridge.



**Ingestion:** Use good personal hygiene. Do not consume or store food in the work area. Wash hands before smoking or eating.

### Engineering Controls

**Ventilation:** Provide general and/or local exhaust ventilation to control airborne levels below the exposure guidelines.

## 9. Physical and Chemical Properties

Physical State	Liquid
Color	Yellow to brown
Odor	Mild
Flash Point - Closed Cup	149 °C <i>ASTM D3828</i>
Flammable Limits In Air	<b>Lower:</b> No test data available <b>Upper:</b> No test data available
Autoignition Temperature	No test data available
Vapor Pressure	< 0.01 mmHg @ 25 °C <i>Literature</i>
Boiling Point (760 mmHg)	245 °C <i>Literature</i>
Vapor Density (air = 1)	low volatile
Specific Gravity (H <sub>2</sub> O = 1)	0.98 25 °C/25 °C <i>Literature</i>
Freezing Point	No test data available
Melting Point	No test data available
Solubility in Water (by weight)	Partially soluble
pH	Not applicable
Kinematic Viscosity	12 mm <sup>2</sup> /s <i>Literature</i>

## 10. Stability and Reactivity

### Stability/Instability

Stable under recommended storage conditions. See Storage, Section 7.

**Conditions to Avoid:** Product can oxidize at elevated temperatures. Generation of gas during decomposition can cause pressure in closed systems.

**Incompatible Materials:** Avoid contact with strong acids. Avoid contact with oxidizing materials. Contamination with water can cause corrosion of common metals and can generate flammable hydrogen gas. Avoid contact with metals such as: Aluminum. Aluminum alloys.

### Hazardous Polymerization

Will not occur.

### Thermal Decomposition

Decomposition products depend upon temperature, air supply and the presence of other materials. Decomposition products can include and are not limited to: Aldehydes. Ketones. Organic acids.

## 11. Toxicological Information

### Acute Toxicity

#### Ingestion

For similar material(s): LD<sub>50</sub>, Rat 1,260 - 2,520 mg/kg

#### Skin Absorption

The dermal LD<sub>50</sub> has not been determined.

### Repeated Dose Toxicity

Symptoms of excessive exposure may be anesthetic or narcotic effects; dizziness and drowsiness may be observed.

**Developmental Toxicity**

Contains component(s) which did not cause birth defects in laboratory animals.

**Genetic Toxicology**

In vitro genetic toxicity studies were negative for component(s) tested.

**Component Toxicology - Dipropylene glycol monomethyl ether**

<b>Skin Absorption</b>	LD50, Rabbit > 20 ml/kg
------------------------	-------------------------

**Component Toxicology - Dipropylene glycol monomethyl ether**

<b>Inhalation</b>	LC50, 7 h, Aerosol, Rat > 500 ppm
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## 12. Ecological Information

**CHEMICAL FATE****Movement & Partitioning**

For similar material(s): No bioconcentration is expected because of the relatively high water solubility. Potential for mobility in soil is very high (Koc between 0 and 50).

**Persistence and Degradability**

For similar material(s): Biodegradation under aerobic static laboratory conditions is low (BOD20 or BOD28/ThOD between 2.5 and 10%).

**ECOTOXICITY**

For similar material(s): Material is practically non-toxic to fish on an acute basis (LC50 > 100 mg/L).

**Fish Acute & Prolonged Toxicity**

LC50, emerald shiner (Notropis atherinoides): > 100 mg/l

NOEC mortality, emerald shiner (Notropis atherinoides): > 100 mg/l

## 13. Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER. All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. DOW HAS NO CONTROL OVER THE MANAGEMENT PRACTICES OR MANUFACTURING PROCESSES OF PARTIES HANDLING OR USING THIS MATERIAL. THE INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS INTENDED CONDITION AS DESCRIBED IN MSDS SECTION: Composition Information. FOR UNUSED & UNCONTAMINATED PRODUCT, the preferred options include sending to a licensed, permitted: Incinerator or other thermal destruction device. As a service to its customers, Dow can provide names of information resources to help identify waste management companies and other facilities which recycle, reprocess or manage chemicals or plastics, and that manage used drums. Telephone Dow's Customer Information Group at 1-800-258-2436 or 1-989-832-1556 (U.S.), or 1-800-331-6451 (Canada) for further details.

## 14. Transport Information

**TDG Small container**  
NOT REGULATED

**TDG Large container**  
NOT REGULATED

**IMDG**

NOT REGULATED

**ICAO/IATA**

NOT REGULATED

**15. Regulatory Information****US. Toxic Substances Control Act**

All components of this product are on the TSCA Inventory or are exempt from TSCA Inventory requirements under 40 CFR 720.30

**CEPA - Domestic Substances List (DSL)**

All substances contained in this product are listed on the Canadian Domestic Substances List (DSL) or are not required to be listed.

**Hazardous Products Act Information: CPR Compliance**

This product has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

**Hazardous Products Act Information: WHMIS Classification**

D1B	Untested Mixture Containing a Material Qualifying as D1B
E	Corrosive to Metal or Skin

**Hazardous Products Act Information: Hazardous Ingredients**

This product contains the following ingredients which are Controlled Products and/or are on the Ingredient Disclosure List (Canadian HPA Section 13 and 14).

Component	CAS #	Amount W/W
Potassium Hydroxide	1310-58-3	<= 2.0 %
Dipropylene glycol monomethyl ether	34590-94-8	<= 1.7 %

**16. Other Information****Product Literature**

Additional information on this product may be obtained by calling your Dow Chemical Company sales or customer service contact.

**Hazard Rating System**

NFPA	Health	Fire	Reactivity
	3	1	0

**Recommended Uses and Restrictions**

Flotation frother.

**Revision**

Identification Number: 51244 / 1001 / Issue Date 2007.08.08 / Version: 3.1

Most recent revision(s) are noted by the bold, double bars in left-hand margin throughout this document.

**Legend**

N/A	Not available
W/W	Weight/Weight
OEL	Occupational Exposure Limit
STEL	Short Term Exposure Limit
TWA	Time Weighted Average

ACGIH	American Conference of Governmental Industrial Hygienists, Inc.
DOW IHG	Dow Industrial Hygiene Guideline
WEEL	Workplace Environmental Exposure Level
HAZ_DES	Hazard Designation
VOL/VOL	Volume/Volume

*The Dow Chemical Company urges each customer or recipient of this (M)SDS to study it carefully and consult appropriate expertise, as necessary or appropriate, to become aware of and understand the data contained in this (M)SDS and any hazards associated with the product. The information herein is provided in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ between various locations. It is the buyer's/user's responsibility to ensure that his activities comply with all federal, state, provincial or local laws. The information presented here pertains only to the product as shipped. Since conditions for use of the product are not under the control of the manufacturer, it is the buyer's/user's duty to determine the conditions necessary for the safe use of this product. Due to the proliferation of sources for information such as manufacturer-specific (M)SDSs, we are not and cannot be responsible for (M)SDSs obtained from any source other than ourselves. If you have obtained an (M)SDS from another source or if you are not sure that the (M)SDS you have is current, please contact us for the most current version.*





Anachemia

255 Norman.  
Lachine (Montreal), Que  
H8R 1A3

# Material Safety Data Sheet

## EMERGENCY NUMBERS:

(USA) CHEMTREC : 1(800) 424-9300 (24hrs)  
(CAN) CANUTEC : 1(613) 996-6666 (24hrs)  
(USA) Anachemia : 1(518) 297-4444  
(CAN) Anachemia : 1(514) 489-5711

WHMIS	Protective Clothing	TDG Road/Rail
WHMIS CLASS: E		Not controlled under TDG (Canada). PIN: Not applicable. PG: Not applicable.
		

## Section I. Product Identification and Uses

Product name	<b>SODA LIME INDICATING 4-8 MESH</b>	CI#	Not available.
Chemical formula	Not applicable.	CAS#	Not applicable.
Synonyms	Sodasorb® absorbent, AC-8213, 79810	Code	AC-8213
Supplier	Anachemia Canada. 255 Norman. Lachine (Montreal), Que H8R 1A3	Formula weight	Not applicable.
		Supersedes	
Material uses	For laboratory use only.		

## Section II. Ingredients

Name	CAS #	%	TLV
1) CALCIUM HYDROXIDE	1305-62-0	>80	Exposure limit: ACGIH TWA 5 mg/m <sup>3</sup> Exposure limit: ACGIH Ceiling limit 2 mg/m <sup>3</sup> Exposure limit: ACGIH Ceiling limit 2 mg/m <sup>3</sup>
2) POTASSIUM HYDROXIDE	1310-58-3	<3	
3) SODIUM HYDROXIDE	1310-73-2	<2	

<b>Toxicity values of the hazardous ingredients</b> CALCIUM HYDROXIDE: ORAL (LD50): Acute: 7340 mg/kg (Rat). 7300 mg/kg (Mouse). SODIUM HYDROXIDE: ORAL (LD50): Acute: 140-340 mg/kg (Rat). DERMAL (LD50): Acute: 1350 mg/kg (Rabbit). INTRAPERITONEAL (LD50): Acute: 40 mg/m <sup>3</sup> (Mouse). POTASSIUM HYDROXIDE: ORAL (LD50): Acute: 273 mg/kg (Rat).
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**Section III. Physical Data**

SODA LIME INDICATING 4-8 MESH

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Physical state and appearance / Odor	Solid. (White granules. Odorless.)
pH (1% soln/water)	Not available.
Odor threshold	Not available.
Percent volatile	0-19% as moisture loss
Freezing point	Not available.
Boiling point	Not available.
Specific gravity	~2 (Water = 1)
Vapor density	Not available.
Vapor pressure	Not available.
Water/oil dist. coeff.	Not available.
Evaporation rate	Not available.
Solubility	Partially soluble in cold water.

**Section IV. Fire and Explosion Data**

Flash point	Not available.
Flammable limits	Not available.
Auto-ignition temperature	Not available.
Fire degradation products	Some metallic oxides.
Fire extinguishing procedures	Use extinguishing media suitable for surrounding materials. Wear adequate personal protection to prevent contact with material or its combustion products. Self contained breathing apparatus with a full facepiece operated in a pressure demand or other positive pressure mode.
Fire and Explosion Hazards	Not expected to be sensitive to static discharge. Not expected to be sensitive to mechanical impact. Emits toxic fumes under fire conditions.

**Section V. Toxicological Properties**

Routes of entry	Inhalation and ingestion. Skin contact. Eye contact.
Effects of Acute Exposure	Harmful by ingestion, inhalation or skin absorption. Corrosive.
Eye	Causes severe burns and loss of vision. May cause permanent damage. IRRITATION: EYE-RABBIT 10 mg (Calcium hydroxide) SEVERE.
Skin	Causes severe burns. May cause blistering.
Inhalation	Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract. Inhalation may be fatal as a result of spasm, inflammation and edema of the larynx and bronchi, chemical pneumonitis and pulmonary edema. Symptoms of exposure may include burning sensation, coughing, laryngitis, dyspnea, headache, nausea, and vomiting.
Ingestion	Harmful if swallowed. Burns in mouth, pharynx and gastrointestinal tract. May cause pain, vomiting, diarrhea, gastrointestinal injury and collapse.

## Section V. Toxicological Properties

SODA LIME INDICATING 4-8 MESH

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**Effects of Chronic Overexposure** Prolonged or repeated overexposure can cause damage to eyes, skin, and mucous membranes. Carcinogenic effects: Not available. Mutagenic effects: Not available. Teratogenic effects: Not available. Toxicity of the product to the reproductive system: Not available. To the best of our knowledge, the chemical, physical, and toxicity of this substance has not been fully investigated.

## Section VI. First Aid Measures

**Eye contact** IMMEDIATELY flush eyes with copious quantities of water for at least 15 minutes holding lids apart to ensure flushing of the entire surface. Seek immediate medical attention.

**Skin contact** Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Call a physician. Wash contaminated clothing before reusing.

**Inhalation** Remove patient to fresh air. Administer approved oxygen supply if breathing is difficult. Administer artificial respiration or CPR if breathing has ceased. Call a physician.

**Ingestion** Do not induce vomiting. Dilute with weak vinegar solution or a 5% solution of ammonium chloride if available. If not, dilute with large quantities of water. Get immediate medical attention. Never give anything by mouth to an unconscious or convulsing person.

## Section VII. Reactivity Data

**Stability** Unstable. Absorbs carbon dioxide and moisture from air. Conditions to avoid: High temperatures, sparks, open flames and all other sources of ignition, contamination.

**Hazardous decomp. products** Not available.

**Incompatibility** Reacts violently with maleic anhydride, nitro organic products (nitroalkanes, nitroethane, nitromethane, nitropropane, nitroparaffins, etc...), chloro organic compounds, metals (aluminum, zinc, tin, etc...), phosphorus. Acids, chloroform, trichloroethylene, organic materials. Contact with chlorophenols with potassium nitrate forms highly toxic products.

**Reaction Products** May react with chloroform slightly, producing sodium formate, carbon monoxide, and phosgene. Will react with trichloroethylene, producing dichloroacetylene, carbon monoxide, and phosgene. Will be neutralized by acids. Explosive when mixed with nitro organic compounds. Solutions can be corrosive to metals. Hazardous polymerization will not occur.

## Section VIII. Preventive Measures

SODA LIME INDICATING 4-8 MESH

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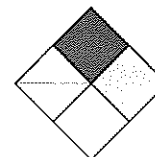
Protective Clothing in case of spill and leak	Wear self-contained breathing apparatus, rubber boots and heavy rubber gloves.
Spill and leak	Evacuate the area. Sweep up and place in container for disposal. Avoid raising dust. Ventilate area and wash spill site after material pick up is complete. DO NOT empty into drains. DO NOT touch damaged container or spilled material.
Waste disposal	According to all applicable regulations. Harmful to aquatic life at low concentrations. Can be dangerous if allowed to enter drinking water intakes. Do not contaminate domestic or irrigation water supplies, lakes, streams, ponds, or rivers.
Storage and Handling	Keep from freezing; absorption rates may be reduced at temperatures below freezing. Store in a cool place away from heated areas, sparks, and flame. Store in a well ventilated area. Store away from incompatible materials. Do not add any other material to the container. Do not wash down the drain. Do not breathe dust. Keep container tightly closed and dry. Product is highly hygroscopic. Manipulate under an adequate fume hood. Avoid raising dust. Empty containers may contain a hazardous residue. Handle and open container with care. Minimize dust generation and exposure - use dust mask or appropriate protection. Take off immediately all contaminated clothing. This product must be manipulated by qualified personnel. Do not get in eyes, on skin, or on clothing. Wash well after use. In accordance with good storage and handling practices. Do not allow smoking and food consumption while handling.

## Section IX. Protective Measures

Protective clothing	Splash goggles. Impervious gloves, apron, coveralls, and/or other resistant protective clothing. Sufficient to protect skin. Wear dust mask. If more than TLV, do not breathe vapor. Wear self-contained breathing apparatus. Do not wear contact lenses. Make eye bath and emergency shower available. Ensure that eyewash station and safety shower is proximal to the work-station location.
Engineering controls	Use only in a chemical fume hood to keep airborne levels below recommended exposure limits. Do not use in unventilated spaces.

## Section X. Other Information

Special Precautions or comments	Corrosive! Harmful solid! Causes severe burns! Do not breathe dust. Avoid all contact with the product. Avoid prolonged or repeated exposure. Use only in a chemical fume hood. Handle and open container with care. Container should be opened only by a technically qualified person. Keep all soda lime that has been used with highly flammable anesthetics away from heat, sparks and open flames, as residual amounts of these materials will be present. Synergistic materials: Not available.
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NFPA

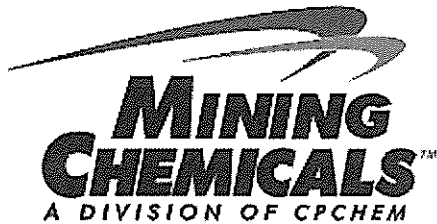
Prepared by MSDS Department/Département de F.S..

Validated 24-Oct-2001

) Telephone# (514) 489-5711

While the company believes the data set forth herein are accurate as of the date hereof, the company makes no warranty with respect thereto and expressly disclaims all liability for reliance thereon. Such data are offered solely for your consideration, investigation and verification.





# Material Safety Data Sheet

## Orfom(R) PAX

February 15, 2002

MSDS #: 76060

Revision #: 0

CHEVRON PHILLIPS CHEMICAL COMPANY LP  
10001 Six Pines Drive  
The Woodlands, TX 77380

### PHONE NUMBERS

#### HEALTH:

Chevron Phillips Emergency  
Information Center 866.442.9628  
(North America) and  
1.832.813.4984 (International)

#### TRANSPORTATION:

North America: CHEMTREC 800.424.9300  
or 703.527.3887  
ASIA: 1.703.527.3887  
EUROPE: BIG .32.14.584545 (phone)  
or .32.14.583516 (telefax)  
SOUTH AMERICA SOS-Cotec  
Inside Brazil: 0800.111.767  
Outside Brazil: 55.19.3467.1600  
Technical Services: (832) 813-4862  
For Additional MSDSs: (800) 852-5530

## A. Product Identification

Synonyms: Not Established  
Chemical Name: Potassium Amyl Xanthate  
Chemical Family: Dithiocarbonate  
Chemical Formula: C<sub>5</sub>H<sub>11</sub>OCS<sub>2</sub>K  
CAS Reg. No.: 2720-73-2  
Product No.: Not Established

Product and/or Components Entered on EPA's TSCA Inventory: YES  
This product is in U.S. commerce, and is listed in the Toxic Substances Control Act (TSCA) Inventory of Chemicals; hence, it may be subject to applicable TSCA provisions and restrictions.

Canadian Inventory Listing Status: DSL  
All ingredients are listed in the Domestic Substances List (DSL).  
Impurities are exempt in accordance with Section 3 of the Canadian Environmental Protection Act (CEPA).

## B. Components

Ingredients	CAS Number	% By Wt.	OSHA PEL	ACGIH TLV
Potassium Amyl Xanthate	2720-73-2	93 min.	NE	NE
Potassium Hydroxide	1310-58-3	0.15	2 ppm(c)	2 ppm (c)

(c) Ceiling Limit

See Section F, for additional Recommended Exposure Limits

## C. Personal Protection Information

Ventilation: Use adequate ventilation to control exposure below recommended level.

Respiratory Protection: Not generally required unless needed to prevent respiratory irritation.

Eye Protection: Use safety glasses with side shields.

Skin Protection: No special garments required. Avoid unnecessary skin contamination. Use impervious rubber gloves.

NOTE: Personal protection information shown in Section C is based upon general information as to normal uses and conditions. Where special or unusual uses or conditions exist, it is suggested that the expert assistance of an industrial hygienist or other qualified professional be sought.

## D. Handling and Storage Precautions

Do not get in eyes, on skin or on clothing. Do not breathe vapors, mist, fume or dust. Wear protective equipment and/or garments described above if exposure conditions warrant. Wash thoroughly after handling. Launder contaminated clothing before reuse. Use only with adequate ventilation. When entry into or exit from concentrations of unknown exposure, use NIOSH/MSHA approved self-contained breathing apparatus (SCBA). Wash thoroughly after handling.

Store in a closed containers. Store in cool, well-ventilated area away from ignition sources. Protect from moisture and oxidants.

## E. Reactivity Data

Stability: Stable

Conditions to Avoid: Not Applicable

Incompatibility (Materials to Avoid): Oxygen and strong oxidizing Agents and Moisture

Hazardous Polymerizatio: Will Not Occur  
 Conditions to Avoid: Not Applicable  
 Hazardous Decomposition Products: Carbon oxides and various hydrocarbons  
 formed when burned.

## F. Health Hazard Data

### Recommended Exposure Limits:

Treat as a nuisance particulate	OSHA PEL	ACGIH TVL
Total Dust	15 mg/m3	10 mg/m3
Respirable Fraction	5 mg/m3	NE

### Acute Effects of Overexposure:

Eye: Slight eye irritation

Skin: Slight eye irritation

Inhalation: Aerosol may cause irritation to nose, throat or lungs..

Ingestion: No data available.

### Subchronic and Chronic Effects of Overexposure:

Aerosol has produce liver, kidney and nervous system changes in laboratory animals. Carbon disulfide may be released upon heating or if conditions become acidic. Then headache, dizziness, nervousness, loss of appetite, psychosis, nerve, heart, kidney or liver changes may develop..

### Other Health Effects:

No known applicable information.

### Health Hazard Categories:

	Animal	Human		Animal	Human
Known Carcinogen	___	___	Toxic	___	___
Suspect Carcinogen	___	___	Corrosive	___	___
Mutagen	___	___	Irritant	___	___
Teratogen	___	___	Target Organ Toxin	<u>X</u>	___
Allergic Sensitizer	___	___	Specify - Liver, Kidney, & Nerve		
Highly Toxic	___	___	Toxin-Animal		
Canadian WHIMS:					

## **First Aid and Emergency Procedures:**

Eye: Flush eyes with running water for at least fifteen minutes. If irritation or adverse symptoms develop, seek medical attention.

Skin: Wash skin with soap and water. If irritation develops, seek Medical attention

Inhalation: Remove from exposure.

Ingestion: Promptly induce vomiting and seek medical attention

## **G. Physical Data**

Appearance: Yellowish-grey Powder or Pellets  
Odor: Mild  
Boiling Point: Not Applicable  
Vapor Pressure: Not Applicable  
Vapor Density (Air = 1): Not Applicable  
Solubility in Water: Appreciable  
Specific Gravity (H<sub>2</sub>O = 1): Not Established  
Percent Volatile by Volume: <1  
Viscosity: Not Applicable

## **H. Fire and Explosion Data**

Flash Point (Method Used): Not Applicable  
Flammable Limits (% by Volume in Air): LEL - Not Applicable  
UEL - Not Applicable

Fire Extinguishing Media: Dry chemical, foam or carbon dioxide (CO<sub>2</sub>)

Special Fire Fighting Procedures: Evacuate area of all unnecessary personnel. Shut off source, if possible. Use NIOSH/MSHA approved self-contained breathing apparatus and other protective equipment and/or garments described in Section C if conditions warrant. Water fog or spray may be used to cool exposed containers and equipment.

Fire and Explosion Hazards: Sulfur oxides and carbon disulfide Formed when burned.

## **I. Spill, Leak and Disposal Procedures**

**Precautions Required if Material is Released or Spilled:**

Evacuate area of all unnecessary personnel. Wear protective equipment and/or garments described in Section C if exposure conditions warrant. When entry into or exit from concentrations of unknown exposure, use NIOSN/MSHA approved self-contained breathing apparatus (SCBA). Contain spill. Protect from ignition. Keep out of water sources and sewers. Sweep or vacuum up spill. Transfer to disposal drums using non-sparking equipment..

**Waste Disposal (Insure Conformity with all Applicable Disposal Regulations):**  
Incinerate or place in permitted waste management facility.

## **J. DOT Transportation**

Shipping Name: Not Applicable  
Hazard Class: Not Applicable  
ID Number: Not Applicable  
Packing Group: Not Applicable  
Marking: Not Applicable  
Label: Not Applicable  
Placard: Not Applicable  
Hazardous Substance/RQ: Not Applicable  
Shipping Description: Not Applicable  
Packaging References: Not Applicable

## **K. RCRA Classification - Unadulterated Product as a Waste**

Not Applicable

## **L. Protection Required for Work on Contaminated Equipment**

Contact immediate supervisor for specific instructions before work is initiated. Wear protective equipment and/or garments described in Section C if exposure conditions warrant. When entry into or exit from concentrations of unknown exposure, use NIOSH/MSHA approved self-contained breathing apparatus (SCBA).

## **M. Hazard Classification**

X This product meets the following hazard definition(s) as defined by the Occupational Safety and Health Hazard Communication Standard (29 CFR Section 1910.1200):

Combustible Liquid       Flammable Aerosol       Oxidizer  
 Compressed Gas       Explosive       Pyrophoric  
 Flammable Gas       Health Hazard (Section F)       Unstable  
 Flammable Liquid       Organic Peroxide       Water Reactive  
 Flammable Solid

Based on information presently available, this product does not meet any of the hazard definitions of 29 CFR Section 1910.1200.

## **N. Additional Comments**

### **REVISION STATEMENT**

This revision reviews entire MSDS.

SARA 313

As of the preparation date, this product did not contain a chemical or chemicals subject to the reporting requirements of Section 313 of Title III of Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372

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# Material Safety Data Sheet

## Sodium carbonate

ACC# 21080

### Section 1 - Chemical Product and Company Identification

**MSDS Name:** Sodium carbonate

**Catalog Numbers:** AC123670010, AC123670025, AC206800010, AC206800025, AC207765000, AC207810010, AC424280030, AC424285000, S71987, S71987-1, S71987-2, S78416, S78416-1, S78419, BP357-1, NC9644731, S261-10, S263-1, S263-10, S263-3, S263-50, S263-500, S263-50LC, S495-500

**Synonyms:** Crystal Carbonate; Disodium Carbonate; Sal Soda; Soda Ash; Washing Soda**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
497-19-8	Sodium carbonate anhydrous	100	207-838-8

**Hazard Symbols:** XI**Risk Phrases:** 36

### Section 3 - Hazards Identification

#### EMERGENCY OVERVIEW

Appearance: white solid. **Warning!** Harmful if inhaled. May cause eye and skin irritation with possible burns. May cause respiratory and digestive tract irritation.

**Target Organs:** Eyes, skin.**Potential Health Effects**

**Eye:** May result in corneal injury. 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 irritation of the digestive tract.

**Inhalation:** Harmful if inhaled. May cause irritation of the respiratory tract with burning pain in the nose and throat, coughing, wheezing, shortness of breath and pulmonary edema.

**Chronic:** Prolonged or repeated inhalation may cause nosebleeds, nasal congestion, erosion of the teeth, perforation of the nasal septum, chest pain and bronchitis.

## 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 soap and 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 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. Material will not burn. 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. Runoff from fire control or dilution water may cause pollution.

**Extinguishing Media:** Substance is noncombustible; use agent most appropriate to extinguish surrounding fire. Use water fog, dry chemical, carbon dioxide or alcohol type foam.

**Flash Point:** Not available.

**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. Cover with material such as dry soda ash or calcium carbonate and place into a closed container for disposal.

## Section 7 - Handling and Storage

**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. 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:** Good general ventilation should be sufficient to control airborne levels. 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
Sodium carbonate anhydrous	none listed	none listed	none listed

**OSHA Vacated PELs:** Sodium carbonate 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 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. 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:** 11.6 (solution)

**Vapor Pressure:** Not available.

**Vapor Density:** Not available.

**Evaporation Rate:** Not available.

**Viscosity:** Not available.

**Boiling Point:** 400 deg C

**Freezing/Melting Point:** 851 deg C

**Decomposition Temperature:** 400 deg C

**Solubility:** Soluble in water

**Specific Gravity/Density:** 1.55

**Molecular Formula:** Na<sub>2</sub>CO<sub>3</sub>

**Molecular Weight:** 105.9778

## 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, dust generation, excess heat.

**Incompatibilities with Other Materials:** Reacts explosively with red-hot aluminum metal. Incompatible with ammonia + silver nitrate, 2,4-dinitrotoluene, 2,4,6-trinitrotoluene, sulfuric acid, sodium sulfide + water, lithium, phosphorus pentoxide, fluorine, and hydrogen peroxide. Hot concentrated solutions of sodium carbonate are mildly corrosive to steel.

**Hazardous Decomposition Products:** Carbon dioxide, toxic fumes of sodium oxide.

**Hazardous Polymerization:** Has not been reported.

## Section 11 - Toxicological Information

**RTECS#:**

**CAS#** 497-19-8; VZ4050000

**LD50/LC50:**

Not available.

**Carcinogenicity:**

CAS# 497-19-8: 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:** No data available.

## Section 12 - Ecological Information

**Ecotoxicity:** Fish: Bluegill/Sunfish: LC50 = 320 mg/L; 96 Hr.; Static Conditions Cas# 497-19-8

**Environmental:** No information reported.

**Physical:** No information found

**Other:** No information found

## 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
<b>Shipping Name:</b>	No information available.				No information available.
<b>Hazard Class:</b>					
<b>UN Number:</b>					
<b>Packing Group:</b>					

Section 15 - Regulatory Information
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**US FEDERAL****TSCA**

CAS# 497-19-8 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.

**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 TPQ.

**SARA Codes**

CAS # 497-19-8: acute.

**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# 497-19-8 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:**

XI

**Risk Phrases:**

R 36 Irritating 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.

**WGK (Water Danger/Protection)**

CAS# 497-19-8: 1

**Canada - DSL/NDSL**

CAS# 497-19-8 is listed on Canada's DSL List.

**Canada - WHMIS**

This product has a WHMIS classification of D2B.

**Canadian Ingredient Disclosure List**

CAS# 497-19-8 is listed on the Canadian Ingredient Disclosure List.

**Exposure Limits**

Section 16 - Additional Information
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**MSDS Creation Date:** 7/12/1999

**Revision #2 Date:** 1/30/2003

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