



## PHOTOGRAPHERS' FORMULARY INC.

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### JD-3 HOLOGRAPHY PROCESSING KIT

Holographic film plates, supplies, and instructions for holography are available from:

**Integraf LLC**  
Holography Supplies & Resources  
(425) 821-0772  
<http://www.integraf.com>

Recommended by Dr. Tung Jeong of Lake Forest College, the JD-3 holography developer and processing kit provides all the chemicals needed for making holograms using Slavich PFG-01, VRP, VRP-M holographic plates and film sheets. Simply mix the dry chemicals in the JD-3 kit with water to prepare the developer components and bleach solution. If you are using holographic film sheets, remove the film sheet from your film holder after exposure before processing. This formula has been proven to be useful for all kinds of holograms. It is relatively safe, even for the home hobbyist.

JD-3 provides an alternative for using JD-2. The developing chemicals in both kits are the same. Only the bleach is different. The bleach in JD-3 is more benign than that of JD-2, containing copper sulfate and Succinic acid instead of potassium dichromate and sodium bisulfate. The trade off for using this more benign bleach is that the JD-3 process adds a post-treatment step using ascorbic acid (Vitamin C) under bright light. Though optional, this step enhances the brightness and longevity of your finished hologram.

### FOR YOUR CHEMICAL SAFETY

Like many household cleaners, chemicals in general should be considered dangerous and must be treated with respect. Please read all the warning labels on each package. It is good practice to use eye goggles, dust mask, apron and rubber gloves when mixing chemicals. While the chemicals have low volatility, working in a ventilated area is recommended.

Although most chemicals in JD-3 are considered non-hazardous by the EPA, the kit does contain small amounts of chemicals that the EPA does consider hazardous.

**Urea and Ascorbic Acid** may irritate the eyes and skin.

**Catechol** is a toxic central nervous system depressant, methemoglobin former and convulsant; a severe eye, skin, and mucous membrane irritant. It is also a skin sensitizer. Poisoning may affect the liver and kidneys.

Please consult with local sewer and water authorities regarding the proper disposal of darkroom chemicals in your area.

### MIXING THE STOCK SOLUTIONS





The chemicals in this JD-3 kit are already pre-measured to make approximately 1000ml of each of three solutions, and about 500ml of Post-Treatment Stock. You will need to add de-ionized or distilled water, which can be purchased at your local grocery store. It is best to use distilled water that contains no other chemicals although distilled drinking water, which sometimes contains small but negligible amounts of other chemicals, can also be used. Water from your tap generally contains fluoride and other impurities that may reduce the quality of your hologram. For efficiency and safety, teachers or adults should pre-mix the solutions for young students.

10-0340



Gardena, CA

# Material Safety Data Sheet

NFPA	HMIS	Personal Protective Equipment						
<div><div>1</div><div>20</div></div>	<table><tr><td>Health Hazard</td><td>3</td></tr><tr><td>Fire Hazard</td><td>1</td></tr><tr><td>Reactivity</td><td>0</td></tr></table>	Health Hazard	3	Fire Hazard	1	Reactivity	0	<div></div> <div>See Section 15.</div>
Health Hazard	3							
Fire Hazard	1							
Reactivity	0							

## Section 1. Chemical Product and Company Identification

Common Name/ Trade Name	Pyrocatechol	Code	P4870
Manufacturer	SPECTRUM CHEMICAL MFG. CORP. 14422 SOUTH SAN PEDRO STREET GARDENA, CALIFORNIA 90248-9985	CAS#	120-80-9
Commercial Name(s)	Not available	RTECS	UX1050000
Synonym	1,2-Benzenediol	TSCA	On the TSCA list.
Chemical Name	Catechol	CI#	Not available.
Chemical Family	Not available.	<u>In case of emergency</u> <b>CHEMTREC (24hr) 800-424-9300</b> Emergency phone: (310) 516-8000	
Chemical Formula	C6H6O2		
Supplier	SPECTRUM QUALITY PRODUCTS 14422 S. SAN PEDRO STREET GARDENA, CA 90248-9985		

## Section 2. Composition and Information on Ingredients

		Exposure Limits			
Name	CAS#	TWA (mg/m3)	STEL (mg/m3)	CEIL (mg/m3)	% by Weight
Pyrocatechol	120-80-9				100
Toxicological Data on Ingredients	Pyrocatechol:				

## Section 3. Hazards Identification

Potential Acute Health Effects	Extremely dangerous in case of skin contact (corrosive, irritant), of eye contact (irritant), of ingestion, of inhalation. Very dangerous in case of skin contact (sensitizer, permeator). Corrosive to eyes and skin. Severe over-exposure can result in death. Can be fatal if inhaled or ingested. This product may irritate eyes and skin upon contact. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.
Potential Chronic	Extremely dangerous in case of skin contact (corrosive, irritant), of eye contact (irritant), of ingestion, of inhalation. Very dangerous in case of skin contact (sensitizer, permeator). CARCINOGENIC

**Health  
Effects**

EFFECTS: Not available. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. The substance is toxic to lungs, mucous membranes. Toxicity of the product to the reproductive system: Not available. Repeated or prolonged exposure to the substance can produce target organs damage. Repeated exposure to an highly toxic material may produce general deterioration of health by an accumulation in one or many human organs. Repeated or prolonged inhalation of dust may lead to chronic respiratory irritation.

**Section 4. First Aid Measures**

**Eye  
Contact**

Check for and remove any contact lenses. IMMEDIATELY flush eyes with running water for at least 15 minutes, keeping eyelids open. COLD water may be used. DO NOT use an eye ointment. Seek medical attention.

**Skin  
Contact**

If the chemical got onto the clothed portion of the body, remove the contaminated clothes as quickly as possible, protecting your own hands and body. Place the victim under a deluge shower. If the chemical touches the victim's exposed skin, such as the hands: Gently and thoroughly wash the contaminated skin with running water and non-abrasive soap. Be particularly careful to clean folds, crevices, creases and groin. COLD water may be used. Cover the irritated skin with an emollient. If irritation persists, seek medical attention. Wash contaminated clothing before reusing.

**Hazardous  
Skin  
Contact**

Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

**Inhalation**

Allow the victim to rest in a well ventilated area. Seek immediate medical attention.

**Hazardous  
Inhalation**

Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. WARNING: It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention.

**Ingestion**

Remove dentures if any. Watch for an obstruction in the victim's mouth. Remove if possible what is causing the obstruction but do not force fingers or a hard object between the victim's teeth. Have conscious person drink several glasses of water or milk. INDUCE VOMITING by sticking finger in throat. Seek immediate medical attention.

**Hazardous  
Ingestion**

Examine the lips and mouth to ascertain whether the tissues are damaged, a possible indication that the toxic material was ingested; the absence of such signs, however, is not conclusive. Remove dentures if any. Watch for an obstruction in the victim's mouth. Remove if possible what is causing the obstruction but do not force fingers or a hard object between the victim's teeth. If a soft pad can be inserted between the victim's teeth, it will protect the tongue from being bitten. A badly bleeding tongue immensely complicates the patient's problems. Have conscious person drink several glasses of water or milk. INDUCE VOMITING by sticking finger in throat. Lower the head so that the vomit will not reenter the mouth and throat. If convulsions occur, do not restrain the victim, but do remove objects with which he (she) might injure himself (herself) or orient the victim to prevent him (her) from striking fixed heavy objects. If the convulsions cease, turn the victim on the side or face down so that any fluid in the mouth will drain. Seek immediate medical attention.

**Section 5. Fire and Explosion Data**

**Flammability of the Product**

Combustible.

**Auto-Ignition Temperature**

Not available.

**Flash Points**

CLOSED CUP: 127.22.C (261.F) OPEN CUP: 136.67.C (278.F)

**Flammable Limits**

Not available.

<b>Products of Combustion</b>	These products are carbon oxides (CO, CO2).
<b>Fire Hazards in Presence of Various Substances</b>	No specific information is available in our database regarding the flammability of this product in presence of various materials.
<b>Explosion in Presence of Various Substances</b>	Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available. No specific information is available in our database regarding the product's risks of explosion in the presence of various materials.
<b>Fire Fighting Media and Instructions</b>	SMALL FIRE: Use DRY chemicals, CO2, water spray or foam. LARGE FIRE: Use water spray, fog or foam. DO NOT use water jet.
<b>Special Remarks on Fire Hazards</b>	No additional remark.
<b>Special Remarks on Explosion Hazards</b>	No additional remark.

#### Section 6. Accidental Release Measures

<b>Small Spill</b>	Use appropriate tools to put the spilled solid in a convenient waste disposal container.
<b>Large Spill</b>	Poisonous solid. Stop leak if without risk. DO NOT get water inside container. DO NOT touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Eliminate all sources of ignition. Call for assistance on disposal.

#### Section 7. Handling and Storage

<b>Precautions</b>	Keep locked up. Keep away from heat. Keep away from sources of ignition. Empty containers pose a fire risk, evaporate the residue under a fume hood. Ground all equipment containing material. DO NOT ingest. DO NOT breathe dust. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes.
<b>Storage</b>	Keep container dry. Keep in a cool place. Ground all equipment containing material. Keep container tightly closed. Keep in a cool, well-ventilated place. Highly toxic or infectious materials should be stored in a separate locked safety storage cabinet or room.

#### Section 8. Exposure Controls/Personal Protection

<b>Engineering Controls</b>	Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.
<b>Personal Protection</b>	Splash goggles. Lab coat. Dust respirator. Be sure to use a MSHA/NIOSH approved respirator or equivalent. Gloves (impervious). Wear appropriate respirator when ventilation is inadequate.
<b>Personal</b>	Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus

Protection in  
Case of a  
Large Spill

sufficient; consult a specialist BEFORE handling this product.

Exposure  
Limits

TWA: 5 (ppm) TWA: 20 (mg/m ) Consult local authorities for acceptable exposure limits.

#### Section 9. Physical and Chemical Properties

Physical state and appearance	Solid.	Odor	Slight.
Molecular Weight	110.11	Taste	Sweet. Bitter.
pH (1% soln/water)	Not available.	Color	Colorless.
Boiling Point	245.5.C (473.9.F)		
Melting Point	105.C (221.F)		
Critical Temperature	Not available.		
Specific Gravity	1.344 (Water = 1)		
Vapor Pressure	Not available.		
Vapor Density	3.79 (Air = 1)		
Volatility	Not available.		
Odor Threshold	Not available.		
Evaporation rate	Not available.		
Viscosity	Not available.		
Water/Oil Dist. Coeff.	Not available.		
Ionicity (in Water)	Not available.		
Dispersion Properties	See solubility in water.		
Solubility	Soluble in cold water.]		

#### Section 10. Stability and Reactivity Data

Stability	The product is stable.
Instability Temperature	Not available.
Conditions of Instability	No additional remark.
Incompatibility with Various Substances	No specific information is available in our database regarding the reactivity of this material in presence of various other materials.
Corrosivity	Non-corrosive in presence of glass.
Special Remarks on Reactivity	No additional remark.
Special Remarks on Corrosivity	No additional remark.


#### Section 11. Toxicological Information

Routes of Entry	Ingestion. Skin contact. Inhalation.
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<p>Toxicity to Animals</p> <p>Chronic Effects on Humans</p> <p>Other Toxic Effects on Humans</p>	<p>Acute oral toxicity (LD50): 210 mg/kg (Guinea pig). Acute dermal toxicity (LD50): 800 mg/kg (Rabbit).</p> <p>The substance is toxic to lungs, mucous membranes. Toxicity of the product to the reproductive system: Not available.</p> <p>Extremely dangerous in case of skin contact (corrosive, irritant), of eye contact (irritant), of ingestion, of inhalation. Very dangerous in case of skin contact (sensitizer, permeator).</p>
<p>Special Remarks on Toxicity to Animals</p> <p>Special Remarks on Chronic Effects on Humans</p> <p>Special Remarks on other Toxic Effects on Humans</p>	<p>No additional remark.</p> <p>No additional remark.</p> <p>No additional remark.</p>

<b>Section 12. Ecological Information</b>	
Ecotoxicity	Not available.
BOD5 and COD	Not available.
Products of Biodegradation	These products are carbon oxides (CO, CO2).
Toxicity of the Products of Biodegradation	The products of degradation are more toxic.
Special Remarks on the Products of Biodegradation	No additional remark.

<b>Section 13. Disposal Considerations</b>	
Waste Disposal	Recycle to process, if possible. Consult your local or regional authorities.

<b>Section 14. Transport Information</b>	
DOT Classification	DOT CLASS 6.1: Poisonous material.
Identification	Toxic solid, organic, n.o.s. (Pyrocatechol) UN2811 III
Special Provisions for Transport	No additional remark.
DOT (Pictograms)	

Section 15. Other Regulatory Information and Pictograms

Federal and  
State Regulations

Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III requires emergency planning based on Threshold Planning Quantities (TPQs) and release reporting based on Reportable Quantities (RQs) in 40 CFR 355 (used for SARA 302, 304, 311 and 312). Components present in this product at a level which could require reporting under the statute are:

NONE

Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III requires submission of annual report release of toxic chemicals that appear in 40 CFR 372 (used for SARA 313). This information must be included in all MSDSs that are copied and distributed for this material. Components present in this product at a level which could require reporting under the statute are:

Pyrocatechol

Pensylvania Right-To-Know, Hazardous substance List, Hazardous Substances and Special hazardous Substances on the list must be identified when present in products. Components present in this product at a level which could require reporting under the statute are:

Pyrocatechol

Massachusetts Right-To-Know, Substance List (MSL) Hazardous Substances and Extraordinarily Hazardous Substances on the MSL must be identified when present in products. Components present in this product at a level which could require reporting under the statute are:

Pyrocatechol

Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) requires notification of the National Response Center of release of quantities of Hazardous Substances equal or greater than the reportable quantities (RQs) in 40 CFR 302.4. Components present in this product at a level which could require reporting under the statute are:

Pyrocatechol

WARNING: This product contains a chemical known to the State of California to cause cancer. Chemical ingredient(s) requiring this warning:

NONE

WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm. Chemical ingredient(s) requiring this warning: NONE

Other Classifications

WHMIS (Canada)

WHMIS CLASS D-1B: Material causing immediate and serious toxic effects (TOXIC).  
WHMIS CLASS D-2B: Material causing other toxic effects (TOXIC).

DSCL (EEC)

R39- Danger of very serious irreversible effects.  
R41- Risk of serious damage to eyes.  
R21/22- Harmful in contact with skin and

## Other Classifications

## WHMIS (Canada)

WHMIS CLASS D-1B: Material causing immediate and serious toxic effects (TOXIC).  
WHMIS CLASS D-2B: Material causing other toxic effects (TOXIC).

## DSCL (EEC)

R39- Danger of very serious irreversible effects.  
R41- Risk of serious damage to eyes.  
R21/22- Harmful in contact with skin and if swallowed.  
R26/27/28- Very toxic by inhalation, in contact with skin and if swallowed.  
R42/43- May cause sensitization by inhalation and skin contact.

## HMIS (U.S.A.)

## Health Hazard

2

## Fire Hazard

1

## Reactivity

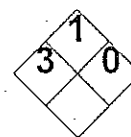
0

## Personal Protection

○

## National Fire Protection Association (U.S.A.)

Health



Flammability

Reactivity

Specific hazard

## Personal Protective Equipment



Protective Gloves (impervious).



Lab coat.



Dust respirator. Be sure to use a MSHA/NIOSH approved respirator or equivalent. Wear appropriate respirator when ventilation is inadequate.



Splash goggles.



**Section 16. Other Information****References** Not available.**Catalog Number(s)** P1455**Other Special Considerations** No additional remark.**Validated by** E. Brull on 12/17/96.**Verified by** E. Brull.  
**Name****Emergency Phone:** (310)516-8000**Notice to Reader**

All chemicals may pose unknown hazards and should be used with caution: This Material Safety Data Sheet (MSDS) applies only to the material as packaged. If this product is combined with other materials, deteriorates, or becomes contaminated, it may pose hazards not mentioned in this MSDS. It shall be the user's responsibility to develop proper methods of handling and personal protection based on the actual conditions of use. While this MSDS is based on technical data judged to be reliable, Spectrum Chemical Mfg. Corp. assumes no responsibility for the completeness or accuracy of the information contained herein.

**THATCHER COMPANY MATERIAL SAFETY DATA SHEET****PRODUCT: SODIUM SULFITE, CATALYZED**

Page 1 of 3

MSDS Date: December 2, 2003

Emergency Contact: 1-800-424-9300

**SECTION I****PRODUCT NAME:** Sodium Sulfite, Catalyzed**CHEMICAL NAME:** Sodium Sulfite, catalyzed**CHEMICAL FAMILY:** Inorganic Sulfite**SYNONYMS:** B 501; Catalyzed Anhydrous Sodium Sulfite**FORMULA:** Na<sub>2</sub>SO<sub>3</sub> + catalyst**DOT SHIPPING INFORMATION:**

Not DOT Regulated

**SECTION II - HAZARDOUS INGREDIENTS**

This material contains no ingredients which are known by Thatcher Company to be hazardous unless listed below.

HAZARDOUS MATERIAL	CAS NUMBER	w/w %	EXPOSURE LIMITS IN AIR
Sodium Sulfite	7757-83-7		TLV = 5 mg/m <sup>3</sup>
Cobalt Sulfate (as Co)	10124-43-3		TLV = 0.05 mg/m <sup>3</sup> * PEL = 0.1 mg/m <sup>3</sup>

\*recommended

The specific identity of some ingredients may be withheld for confidential business purposes. However, all known potential health effects from exposure to these ingredients are being addressed.

**SECTION III - PHYSICAL DATA****BOILING POINT (F):** N/A**SPECIFIC GRAVITY:** 2.633 @ 15.4 EC**VAPOR PRESSURE (mm Hg):** N/A**% VOLATILE, BY VOLUME:** N/A**VAPOR DENSITY (air = 1):** N/A**EVAPORATION RATE:** N/A**SOLUBILITY IN WATER:** Soluble**APPEARANCE AND ODOR:** White to pink crystals or powder with saline, sulfurous taste.**SECTION IV - FIRE AND EXPLOSION DATA****FLASH POINT:** Nonflammable**FLAMMABLE LIMITS:**

Lel: N/A Uel: N/A

**EXTINGUISHING MEDIA:**



THATCHER COMPANY MATERIAL SAFETY DATA SHEET  
PRODUCT: SODIUM SULFITE, CATALYZED  
Page 2 of 3

Use any.

**SPECIAL FIRE-FIGHTING PROCEDURES:**

Wear self-contained breathing apparatus if necessary.

**UNUSUAL FIRE AND EXPLOSION HAZARDS:**

When heated, catalyzed sodium sulfite decomposes and emits highly toxic fumes of sodium oxide and sulfur oxides.

**SECTION V - REACTIVITY DATA**

**STABILITY:** Stable

**HAZARDOUS POLYMERIZATION:** Will not occur.

**CONDITIONS OR MATERIALS TO AVOID:**

None.

**HAZARDOUS DECOMPOSITION PRODUCTS:**

When heated, catalyzed sodium sulfite decomposes and emits toxic fumes of sodium oxide and sulfur oxides.

**SECTION VI - HEALTH HAZARD DATA**

**CARCINOGENIC LISTING:**

NTP: No ingredients listed in this section.

IARC MONOGRAPHS: No ingredients listed in this section.

OSHA 29 CFR 1910: No ingredients listed in this section.

**ENTRY ROUTES & EFFECTS OF OVEREXPOSURE:**

**Contact:** Contact may irritate eyes.

**Ingestion:** If swallowed, can cause irritation of stomach, nausea and gas.

**STATEMENT OF PRACTICAL TREATMENT:**

**Contact:** Flush exposed area thoroughly with soap and water. For eyes, flush with cool water for at least 15 minutes. If irritation persists, get medical attention.

**Ingestion:** If swallowed, give several glasses of water and call a physician immediately.

**SECTION VII - SPECIAL PRECAUTIONS**



THATCHER COMPANY MATERIAL SAFETY DATA SHEET

PRODUCT: SODIUM SULFITE, CATALYZED

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**HANDLING AND STORAGE PRECAUTIONS:**

Store in a cool, dry area.

**STEPS TO BE TAKEN IF MATERIAL SPILLS OR LEAKS:**

Wear proper safety equipment. Sweep up material and put into drums. Flush residue to sewer with large amounts of water (if permitted).

**WASTE DISPOSAL METHOD:**

Dispose of in landfill. Comply with all local, state and federal regulations.

**OTHER PRECAUTIONS:**

N/A

**SECTION VIII - SPECIAL PROTECTION INFORMATION**

**RESPIRATORY PROTECTION:**

Use dust mask as needed to avoid breathing dust.

**VENTILATION:**

Use adequate ventilation.

**EYE PROTECTION:**

Wear goggles or safety glasses.

**SKIN PROTECTION:**

Wear rubber gloves.

**OTHER PROTECTIVE EQUIPMENT:**

None required.

ACGIH = American Conference of Governmental Industrial Hygienists  
CL = Ceiling Level  
IARC = International Agency for Research on Cancer: Monographs  
OSHA = Occupational Safety and Health Administration  
N/A = Not Applicable  
NTP = National Toxicology Program: Annual Report on Carcinogens  
PEL = Permissible Exposure Level (OSHA)  
TLV = Threshold Limit Value (ACGIH)  
TWA = Time Weighted Average over 8 Hours  
STEL = Short Term Exposure Limit (ACGIH)  
ND = Not Determined

This information is, to the best of our knowledge, accurate but may not be complete. THATCHER COMPANY furnishes this information in good faith, but without warranty, representation or guarantee of its accuracy, completeness, or reliability.

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\*3-216005-00

March 31, 1996

Photographers Formulary  
P O Box 950  
Condon, MT 59826

Attn : Regulatory Compliance Department

Dear Customer:

This letter is to inform you that the product listed below that we supply you contains one or more of the toxic chemicals covered by Section 313 of the Emergency Planning and Community Right-to-Know act of 1986. This law requires certain manufacturers to report on annual emissions of specified toxic chemicals and chemical categories.

If you are unsure if you must report, or require further information, call the EPA Emergency Planning and Community Right-to-Know Hotline at (800) 535-0202 or (202) 479-2449 (in Washington or Alaska).

Please attach this letter to the Material Safety Data Sheets for these products. Please also note that if you repackage or otherwise redistribute these products to industrial customers, this letter must accompany the MSDS.

0302561	Copper Sulfate-Lrg Crystal	50#
0302571	Copper Sulfate-Fine Diam	50#
0900311	Isopropynol-Anhy Tech	54 Gal
2100202	Urea	50#
2300152	Windshield Wash	Gal

12/95

10-1480 Rec'd 3-18-94

REPORT NUMBER: 971  
MSDS NO: P10379VS  
EFFECTIVE DATE: 07/16/93

VAN WATERS & ROGERS INC.  
MATERIAL SAFETY DATA SHEET

PAGE: 001

VERSION: 004

PRODUCT: UREA PRILL COMMERCIAL GRADE

ORDER NO:  
PROD NO :

VAN WATERS & ROGERS INC. , SUBSIDIARY OF UNIVAR (206)889-3400  
6100 CARILLON POINT , KIRKLAND , WA 98033

----- EMERGENCY ASSISTANCE -----

FOR EMERGENCY ASSISTANCE INVOLVING CHEMICALS CALL - CHEMTREC  
(800)424-9300

----- FOR PRODUCT AND SALES INFORMATION -----

CONTACT YOUR LOCAL VAN WATERS & ROGERS BRANCH OFFICE AT  
VW&R SPOKANE 509-534-0405 SPOKANE , WA

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PRODUCT IDENTIFICATION

PRODUCT NAME: UREA PRILL COMMERCIAL GRADE

MSDS #: P10379VS

DATE ISSUED: 12/01/92

ISSUED BY: 005222

\*\*\*\*\*  
MANUFACTURER'S MSDS

NFPA FIRE HAZARD SYMBOL\*

Health:	0	4 - Extreme
Flammability:	0	3 - High
Reactivity:	0	2 - Moderate
Special Hazards:		1 - Slight
		0 - Insignificant
		* - See Text

\*\*\*\*\*

REPORT NUMBER: 971  
MSDS NO: P10379VS  
EFFECTIVE DATE: 07/16/93

VAN WATERS & ROGERS INC.  
MATERIAL SAFETY DATA SHEET

PAGE: 00  
VERSION: 00

PRODUCT: UREA PRILL COMMERCIAL GRADE

ORDER NO:  
PROD NO :

PRODUCT IDENTIFICATION

\*\*\*\*\*

TRADE NAME: UREA PRILL - INDUSTRIAL GRADE

CAS NUMBER: 57-13-6

SYNONYM(S): CARBAMIDE; CARBONYLDIAMINE; CARBAMIDIC ACID

CHEMICAL FAMILY: AMIDE

MOLECULAR FORMULA: CH4N2O

MOLECULAR WEIGHT: 60.07

PRODUCT CODE: V 6463

HIERARCHY: 230.050

\*\*\*\*\*

PRODUCT HAZARD SUMMARY

\*\*\*\*\*

HEALTH

MAY BE IRRITATING TO THE SKIN, EYES AND RESPIRATORY TRACT  
HEATED MATERIAL MAY CAUSE THERMAL BURNS

FLAMMABILITY

NON-COMBUSTIBLE

REACTIVITY

STABLE

\*\*\*\*\*

PRODUCT HEALTH HAZARD INFORMATION

\*\*\*\*\*

INGESTION: PRACTICALLY NON-TOXIC. Rat oral LD50 = 14,300 mg/kg. May cause gastrointestinal disturbances. Symptoms may include irritation, nausea, vomiting and diarrhea.

SKIN: SLIGHTLY IRRITATING. Repeated or prolonged skin contact may cause reddening, itching and inflammation. Contact with heated material may cause thermal burns.

EYE: SLIGHTLY IRRITATING. Contact with heated material may cause thermal burns.

INHALATION: May cause respiratory tract irritation.

REPORT NUMBER: 971  
MSDS NO: P10379VS  
EFFECTIVE DATE: 07/16/93

VAN WATERS & ROGERS INC.  
MATERIAL SAFETY DATA SHEET

PAGE: 003  
VERSION: 004

PRODUCT: UREA PRILL COMMERCIAL GRADE

ORDER NO:  
PROD NO :

SPECIAL TOXIC EFFECTS: Urea is a naturally occurring chemical in the body. It is an end product of protein metabolism and is excreted in the urine.

FIRST AID

INGESTION: If victim is conscious, give 1-3 glasses of water or milk to dilute stomach contents and induce vomiting. Do not make an unconscious or semi-conscious person vomit. Get medical attention.

SKIN CONTACT: Wash area of contact thoroughly with soap and water. Launder clothing before reuse. Get medical attention if irritation persists. For contact with molten product, do not remove contaminated clothing. Flush skin immediately with large amounts of cold water. If possible, submerge area in cold water. Pack with ice. Thermal burns require immediate medical attention.

EYE CONTACT: Flush immediately with large amounts of water for at least 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. Get medical attention if irritation persists.

INHALATION: Remove affected person from source of exposure. If not breathing, ensure open airway and institute cardiopulmonary resuscitation (CPR) - If breathing is difficult, administer oxygen if available. Get medical attention.

NOTES TO PHYSICIAN

Supportive measures for severe exposures. Pharmaceutical grade urea is used medically as a diuretic, but not recommended for those with kidney function problems.

EYE PROTECTION: Wear safety glasses or chemical goggles to prevent eye contact. Do not wear contact lenses when working with this substance. Have eye washing facilities readily available where eye contact can occur.

SKIN PROTECTION: Wear impervious gloves and protective clothing to prevent skin contact. Suggested protective materials are: butyl rubber.

RESPIRATORY PROTECTION: If irritation is experienced, NIOSH approved respiratory protection should be worn. Ventilation and other forms of engineering controls are often the preferred means for controlling chemical exposures. Respiratory protection may be needed for non-routine or emergency situations.



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MSDS NO: P10379VS  
EFFECTIVE DATE: 07/16/93

VAN WATERS & ROGERS INC.  
MATERIAL SAFETY DATA SHEET

PAGE: 00  
VERSION: 00

PRODUCT: UREA PRILL COMMERCIAL GRADE

ORDER NO:  
PROD NO :

\*\*\*\*\*  
PHYSICAL PROPERTIES  
\*\*\*\*\*

BOILING POINT: DECOMPOSES

SPECIFIC GRAVITY: NA

MELTING POINT: 133 - 135 C (271.4-275 F)

% VOLATILE: NA

VAPOR PRESSURE: NA

EVAPORATION RATE (WATER = 1): NA

VAPOR DENSITY (AIR=1): NA

VISCOSITY: NA

% SOLUBILITY IN WATER: 119 GM/100 GM @ 25 C

OCTANOL/WATER PARTITION COEFFICIENT: ND

POUR POINT: NA

pH: ND

APPEARANCE/ODOR: WHITE GRANULES W/LITTLE-NO ODOR. NH3 ODOR UPON LONG  
STANDING.

\*\*\*\*\*  
FIRE AND EXPLOSION DATA  
\*\*\*\*\*

FLASH POINT: NA

AUTOIGNITION TEMPERATURE: NA

FLAMMABILITY LIMITS IN AIR (% BY VOL.) LOWER: NA

FLAMMABILITY LIMITS IN AIR (% BY VOL.) UPPER: NA

BASIC FIREFIGHTING PROCEDURES: Use extinguishing agent suitable for type of  
surrounding fire. Material itself burns with difficulty. Urea becomes  
slippery when wet--guard against falls.

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PROD NO :

UNUSUAL FIRE AND EXPLOSION HAZARDS: Irritating or toxic substances may be emitted upon thermal decomposition. Exposed firefighters should wear MSHA/NIOSH approved self-contained breathing apparatus with full face mask and full protective equipment. Uncontaminated urea is not an explosion hazard. May form explosive mixtures subject to spontaneous detonation when contaminated with strong acids (nitric or perchloric) or nitrate fertilizers.

REACTIVITY DATA

STABILITY/INCOMPATIBILITY: Stable when stored at 120 - 160 F and atmospheric pressure. May slowly hydrolyze to ammonium carbamate on long standing which eventually decomposes to ammonia and carbon dioxide. Avoid contact with strong oxidizers, acids or bases. Avoid contact with nitrates. Decomposes to ammonia, biuret, cyanuric acid, NOx, COx.

HAZARDOUS REACTIONS/DECOMPOSITION PRODUCTS: Thermal decomposition products may be hazardous. Reacts with sodium or calcium hypochlorite to form explosive nitrogen trichloride.

ENVIRONMENTAL INFORMATION

Notification: No special procedures are required for clean-up of spills or leaks of this material. Avoid methods that result in water pollution. Caution should be exercised regarding personnel safety and exposure to the spilled material, as set forth elsewhere in this data sheet.

WASTE DISPOSAL: This substance, when discarded or disposed of, is not specifically listed as a hazardous waste in Federal regulations; however it could be characteristically hazardous if it is considered toxic, corrosive, ignitable, or reactive according to Federal definitions (40 CFR 261). Additionally, it could be designated as hazardous according to state regulations. This substance could also become a hazardous waste if it is mixed with or comes in contact with a hazardous waste. Check 40 CFR 261 to determine whether it is a hazardous waste. If it is a hazardous waste, regulations at 40 CFR 262, 263, 264, 268 and 270 apply. Chemical additions, processing or otherwise altering this material may make the waste management information presented in this MSDS incomplete, inaccurate or otherwise inappropriate.

The transportation, storage, treatment, and disposal of this waste material must be conducted in compliance with all applicable Federal, state, and local regulations.

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SARA TITLE III INFORMATION: Listed below are the hazard categories for the Superfund Amendments and Reauthorization Act (SARA) Section 311/312 (40 CFR 370):

Immediate Hazard: Y  
Delayed Hazard: Y  
Fire Hazard: Y  
Pressure Hazard: Y  
Reactivity Hazard: Y

This product does not contain toxic chemicals (in excess of the applicable de minimis concentration) that are subject to the annual toxic chemical release reporting requirements of the Superfund Amendments and Reauthorization Act (SARA) Section 313 (40 CFR 372).

ADDITIONAL ENVIRONMENTAL REGULATORY INFORMATION: There may be specific regulations at the local, regional or state level that pertain to this material.

REGULATORY INFORMATION

All components of this product are listed on the TSCA inventory.

All components of this product are listed on the Canadian DSL Inventory.

The following Canadian Workplace Hazardous Materials Information System (WHMIS) categories apply to this product:

Compressed Gas	-	Flammable/Combustible	-
Oxidizer	-	Acutely Toxic	-
Other Toxic Effects	-	BioHazardous	-
Corrosive	-	Dangerously Reactive	-

SPECIAL PRECAUTIONS/SUPPLEMENTAL INFORMATION

HANDLING/STORAGE: Store in tightly closed containers in cool, dry, isolated, well-ventilated area away from heat, sources of ignition and incompatibles. Avoid contamination with other "look-alike" materials that may produce an explosion hazard (see Unusual Fire and Explosion Hazards section).

EMPTY CONTAINERS: Empty containers may contain product residue. Do not reuse without adequate precautions.

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PRODUCT: UREA PRILL COMMERCIAL GRADE

ORDER NO:  
PROD NO:

TRANSPORTATION REQUIREMENTS

D.O.T. PROPER SHIPPING NAME (49 CFR 172.101): NA

D.O.T. HAZARD CLASS (49 CFR 172.101): NA

UN/NA CODE (49 CFR 172.101): NA

BILL OF LADING DESCRIPTION (49 CFR 172.202): UREA

D.O.T. LABELS REQUIRED (49 CFR 172.101): NA

D.O.T. PLACARDS REQUIRED (49 CFR 172.504): NA

INGREDIENTS/HEALTH HAZARD INFORMATION

COMPONENT	CAS NO.	%	EXPOSURE LIMITS - REF.
Urea	57-13-6	99.90-100	10 mg/m3 (total) TLV (ACGIH), as nuisance dust 5 mg/m3 (resp.); 15 mg/m3 (total) PEL (OSHA), as nuisance dust
Remaining components not determined hazardous and/or hazardous components present at less than 1.0% (0.1% for carcinogens)			NA

ND = No Data

NA = Not Applicable

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----- FOR ADDITIONAL INFORMATION -----

CONTACT: MSDS COORDINATOR VW&R SPOKANE  
DURING BUSINESS HOURS, PACIFIC TIME (206)889-3400

03/15/94 10:57 PRODUCT: CUST NO: ORDER NO:

----- NOTICE -----

-----  
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-----  
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-----  
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\* \* \* E N D O F M S D S \* \* \*

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UNIVAR USA INC.

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MSDS NO: P1349V5

MATERIAL SAFETY DATA SHEET

MAINFRAME UPLOAD DATE: 10/31/97

VERSION: 004

PRODUCT: ASCORBIC ACID, VITAMIN C

ORDER NO: 209212

PROD NO : 720201

PHOTOGRAPHERS FORMULARY

CALL IN ADVANCE TO MEET

7079 HWY 83 N.

BOX 89

CONDON ,MT 59826

UNIVAR USA INC.

6100 CARILLON POINT , KIRKLAND

(425)899-3400

, WA 98033

----- EMERGENCY ASSISTANCE -----

FOR EMERGENCY ASSISTANCE INVOLVING CHEMICALS CALL - CHEMTREC

(800)424-9300

\*\*\*\*\*  
PRODUCT IDENTIFICATION  
\*\*\*\*\*

PRODUCT NAME: ASCORBIC ACID, VITAMIN C

MSDS #: P1349V5

DATE ISSUED: 9/26/97

SUPERSEDES: 1/18/96

ISSUED BY: 005301

\*\*\*\*\*  
1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION  
\*\*\*\*\*

Chemical Name: Ascorbic Acid, Vitamin C .

Trade Name: Ascorbic Acid, Vitamin C USP-FDC .

Chemical Family: Organic

Formula: C<sub>6</sub>H<sub>8</sub>O<sub>6</sub>

Molecular Weight: 176.12 g/mol

\*\*\*\*\*  
2. COMPOSITION / INFORMATION ON INGREDIENTS  
\*\*\*\*\*

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UNIVAR USA INC.

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PRODUCT: ASCORBIC ACID, VITAMIN C

ORDER NO: 209212

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\*\*\*\*\*

Component	CAS #	Appr %
Ascorbic Acid	50-81-7	>99%

\*\*\*\*\*

### 3. HAZARDS IDENTIFICATION

\*\*\*\*\*

#### EMERGENCY OVERVIEW

Not available.

See product label for specific hazard warnings.

See MSDS Section 3 - "Symptoms of Exposure" for health hazard information.

Appearance: White powder to crystals

#### POTENTIAL HEALTH EFFECTS (ACUTE AND CHRONIC)

Symptoms of Exposure:

Eyes: May cause irritation on contact with the eyes.

Skin: May cause irritation on contact with the skin.

Inhalation: Expected to cause general respiratory tract irritation after inhalation of dust.

Ingestion: Material is virtually non-toxic.

Medical Cond. Aggravated by Exposure:  
Unknown.

Routes of Entry:

Eye and skin contact and inhalation are anticipated as possible routes of exposure. Ingestion is not expected

Mutagenicity:

This material is not known to cause cancer in humans or animals.

\*\*\*\*\*

### 4. FIRST AID MEASURES

\*\*\*\*\*

Emergency First Aid:

Eyes: Flush with copious amounts of water for fifteen minutes. Get medical attention if symptoms persist.

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Skin: Remove excess material and wash affected skin with soap and water.  
Gently dry area with a clean towel.

Inhalation: Remove to uncontaminated area. If not breathing give artificial  
respiration. If breathing is difficult, give oxygen.

Ingestion: Induce vomiting if conscious and as directed by a physician.  
Never give anything by mouth to an unconscious person. Get medical attention.

#### Notes EMS:

Emergency treatment information is not available for this product.

### 5. FIRE FIGHTING MEASURES

Flash Point (F): Not ignitable. Flash point not applicable.

Flammable Limits LEL (%): Not applicable.

Flammable Limits UEL (%): Not applicable.

Auto Ign: Not applicable.

#### Extinguishing Media:

Flood with water or use carbon dioxide, foam, or dry chemical.

#### Fire Fighting Procedures:

Positive pressure self-contained breathing apparatus and structural  
firefighters' protective clothing as required for other materials  
present.

#### Fire & Explosion Hazards:

Irritating or toxic gases, fumes, smoke, or particulates. Unusual fire or  
explosion hazards are not expected. Relative hazard is anticipated to be the  
same as normal combustible materials.

### 6. ACCIDENTAL RELEASE MEASURES

#### Spill Response:

Evacuate the area of all unnecessary personnel.

Wear suitable protective equipment listed under Exposure / Personal  
Protection.



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Eliminate any ignition sources until the area is determined to be free from explosion or fire hazards.

Maintain the release and eliminate its source, if this can be done without risk.

Make up and containerize for proper disposal as described under Disposal.

Comply with Federal, State, and local regulations on reporting releases.

Refer to Regulatory Information for reportable quantity and other regulatory data.

\*\*\*\*\*

#### 7. HANDLING AND STORAGE

\*\*\*\*\*

##### Handling & Storage:

Keep container tightly closed. Store in general chemical storage. Protect against physical damage. Handle carefully. Store away from incompatible materials. Avoid generating dust or vapors.

\*\*\*\*\*

#### 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

\*\*\*\*\*

##### ENGINEERING CONTROLS AND PERSONAL PROTECTIVE EQUIPMENT:

Ventilation, Respiratory Protection, Protective Clothing, Eye Protection  
Safety goggles or safety glasses with side shields are required.

Provide adequate general mechanical ventilation and local exhaust ventilation.

##### Work / Hygienic Practices:

When handling quantities of material, be sure to wear appropriate protective equipment as described. Respirators must be worn when Permissible Exposure Limit (PEL) or Threshold Limit Value (TLV) is exceeded. Eye wash and safety shower should be readily available.

Wash thoroughly after handling. Do not take internally. Avoid breathing dust or vapor when generated.

Mechanical ventilation of work areas should be provided where the material is being used.

##### EXPOSURE GUIDELINES

HA - PEL:

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Component	TWA		STEL		CL		Skin
	PPM	MG/M3	PPM	MG/M3	PPM	MG/M3	

Ascorbic Acid

ACGIH - TLV:

Component	TWA		STEL		CL		Skin
	PPM	MG/M3	PPM	MG/M3	PPM	MG/M3	

Ascorbic acid

#### 9. PHYSICAL AND CHEMICAL PROPERTIES

Boiling Point (C 760 mmHg): Not applicable

Melting Point (C): 192 C

Specific Gravity (H2O = 1): not applicable

Bulk Density: N/A

Vapor Pressure (mm Hg): Not applicable.

Percent Volatile by Vol (%): <1% (volume)

Vapor Density (Air = 1): N/A

Evaporation Rate (BuAc = 1): Not applicable.

pH Aqueous Solution: Not determined

Solubility in Water (%): Soluble

Appearance: White powder to crystals

#### 10. STABILITY AND REACTIVITY

Stability: Stable under normal conditions of storage or use.

Hazardous Polymerization:

Will not occur under normal conditions of storage or use.

Hazardous Decomposition:

Not determined

Conditions To Avoid:

NA

Materials To Avoid:

( ) Water

(X) Acids

(X) Bases

( ) Corrosives

(X) Oxidizers

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) Other :

#### 11. TOXICOLOGICAL INFORMATION

##### Toxicity Data:

Not available. Material not fully investigated. Handle as a potentially toxic material.

##### Toxicological Findings:

No evaluation of toxicological data on this material is currently available. See Section 3 of this MSDS for an overview of known or anticipated health effects.

#### 12. DISPOSAL CONSIDERATIONS

Waste Numbers: N/A

##### Treatment:

Not applicable; material is a non-hazardous and non-regulated solid waste. Do not mix with bulk or containerized wastes of this material to a secure industrial landfill or thermal oxidation facility. Incineration is not recommended for organics.

These methods are drawn from 40 CFR , Protection of Environment, and are to be applied only after thorough review of all applicable Methods of Treatment or Treatment Standards. The waste generator is advised to contract with a Licensed Treatment, Storage, and Disposal facility when arranging for final disposal and to consult state and local authorities to determine whether any additional regulatory requirements need to be met.

#### 13. TRANSPORT INFORMATION

T Proper Shipping Name:	Not regulated.
T Technical Name:	Technical name not required.
T ID Number:	Not applicable.
T Hazard Class:	Not applicable.
T Subsidiary Risk:	Not applicable.
T Packing Group:	N/A
T Label(s) Required:	Not applicable.
T Other:	Not applicable.

TA Proper Shipping Name: Not regulated.

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IATA ID Number: Not applicable.  
IATA Hazard Class: Not applicable.  
IATA Subsidiary Risk: Not applicable.  
IATA Packing Group: N/A  
IATA Label(s) Required: Not applicable.  
IATA Other: Not applicable.

IMDG Proper Shipping Name: Not regulated.  
IMDG ID Number: Not applicable.  
IMDG Hazard Class: Not applicable.  
IMDG Subsidiary Risk: Not applicable.  
IMDG Packing Group: N/A  
IMDG Label(s) Required: Not applicable.  
IMDG Other: Not applicable.

#### 14. REGULATORY INFORMATION

TSCA Inventory: N/A

TSCA Statement:

The components of this material appear in the Toxic Substances Control Act (TSCA) Chemical Substances Inventory and are available for commercial use.

OSHA Specifically Required

This material is not regulated by OSHA.

TSCA Memo: NONE

SARA Title III Hazard Categories:

Acute Health

Component	SARA EHS (302)	SARA EHS TPQ (lbs)	CERCLA RQ (lbs)
Ascorbic Acid			

Component	OSHA Floor List	SARA 313	De minimis for SARA 313 (%)
Ascorbic Acid			

#### 15. OTHER INFORMATION

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ORDER NO: 209212

PROD NO : 720201

Comments:

NE

HIS Hazard Ratings:

Health : 0  
Flammability : 0  
Reactivity : 0  
Protective Equipment : A  
Special Hazards : NA

A = NOT AVAILABLE

E = NOT ESTABLISHED

----- FOR ADDITIONAL INFORMATION -----

CONTACT: MSDS COORDINATOR

UNIVAR USA INC.

DURING BUSINESS HOURS, PACIFIC TIME

(425)889-3400

12/24/02 11:17 PRODUCT: 720201 CUST NO: 113345 ORDER NO: 209212

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VERSION: 004

PRODUCT: ASCORBIC ACID, VITAMIN C

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PROD NO : 720201

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\*\*\* END OF MSDS \*\*\*

REPORT NUMBER: 703 UNIVAR USA INC. PAGE: 001  
SDS NO: MZC5918 MATERIAL SAFETY DATA SHEET  
INFRAME UPLOAD DATE: 09/20/01 VERSION: 003

PRODUCT: COPPER SULFATE NON FIFRA REGISTERED

ORDER NO: 221078  
PROD NO : 681669

PHOTOGRAPHERS FORMULARY  
C/O RETL DOCK MISSOULA  
CALL BUD AND HE WILL  
COME & PICK THESE UP.  
MISSOULA ,MT 59808

UNIVAR USA INC. (425)889-3400  
100 CARILLON POINT , KIRKLAND , WA 98033

----- EMERGENCY ASSISTANCE -----

FOR EMERGENCY ASSISTANCE INVOLVING CHEMICALS CALL - CHEMTREC  
(800)424-9300

PRODUCT NAME: COPPER SULFATE NON FIFRA REGISTERED  
SDS NUMBER: MZC5918  
EFFECTIVE DATE: 8/9/2001  
SUPERSEDES: 5/10/2001  
ISSUED BY: 008614

.. PRODUCT IDENTIFICATION

SYNONYMS: COPPER (II) SULFATE PENTAHYDRATE (1:1:5); BLUE VITRIOL;  
SULFURIC ACID COPPER (2+) SALT (1:1), PENTAHYDRATE  
CAS NO: 7758-98-7 (ANHYDROUS) 7758-99-8 (PENTAHYDRATE)  
MOLECULAR WEIGHT: 249.68  
CHEMICAL FORMULA: CUSO4.5H2O

.. COMPOSITION/INFORMATION ON INGREDIENTS

INGREDIENT	CAS NO	PERCENT	HAZARDOUS
OPRIC SULFATE	7758-98-7	100%	YES

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AINFRAME UPLOAD DATE: 09/20/01

VERSION: 003

RODUCT: COPPER SULFATE NON FIFRA REGISTERED

ORDER NO: 221078

PROD NO : 681669

### 3. HAZARDS IDENTIFICATION

#### EMERGENCY OVERVIEW

WARNING! HARMFUL IF SWALLOWED. AFFECTS THE LIVER AND KIDNEYS. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT.

#### POTENTIAL HEALTH EFFECTS

##### INHALATION:

CAUSES IRRITATION TO RESPIRATORY TRACT, SYMPTOMS MAY INCLUDE COUGHING, SORE THROAT, AND SHORTNESS OF BREATH. MAY RESULT IN ULCERATION AND PERFORATION OF RESPIRATORY TRACT. WHEN HEATED, THIS COMPOUND MAY GIVE OFF COPPER FUME, WHICH CAN CAUSE SYMPTOMS SIMILAR TO THE COMMON COLD, INCLUDING CHILLS AND STIFFNESS OF THE HEAD.

##### INGESTION:

MAY CAUSE BURNING PAIN IN THE MOUTH, ESOPHAGUS, AND STOMACH. HEMORRHAGIC GASTRITIS, NAUSEA, VOMITING, ABDOMINAL PAIN, METALLIC TASTE, AND DIARRHEA MAY OCCUR. IF VOMITING DOES NOT OCCUR IMMEDIATELY SYSTEMIC COPPER POISONING MAY OCCUR. SYMPTOMS MAY INCLUDE CAPILLARY DAMAGE, HEADACHE, COLD SWEAT, RARE PULSE, KIDNEY AND LIVER DAMAGE, CENTRAL NERVOUS EXCITATION FOLLOWED BY DEPRESSION, JAUNDICE, CONVULSIONS, BLOOD EFFECTS, PARALYSIS AND COMA. DEATH MAY OCCUR FROM SHOCK OR RENAL FAILURE. FATALITIES HAVE OCCURRED AS A RESULT OF INGESTING GRAM QUANTITIES OF COPPER SULFATE.

##### SKIN CONTACT:

MAY CAUSE IRRITATION AND ITCHING.

##### EYE CONTACT:

JUST MAY CAUSE IRRITATION. CONTACT MAY CAUSE CONJUNCTIVITIS, ULCERATION, OR REDDING OF THE CORNEA.

##### CHRONIC EXPOSURE:

PROLONGED OR REPEATED SKIN EXPOSURE MAY CAUSE DERMATITIS. PROLONGED OR REPEATED EXPOSURE TO DUSTS OF COPPER SALTS MAY CAUSE DISCOLORATION OF THE SKIN OR HAIR, BLOOD AND LIVER DAMAGE, ULCERATION AND PERFORATION OF THE NASAL SEPTUM, RUNNY NOSE, METALLIC TASTE, AND ATROPHIC CHANGES AND IRRITATION OF THE MUCOUS MEMBRANES.

##### AGGRAVATION OF PRE-EXISTING CONDITIONS:

PERSONS WITH PRE-EXISTING SKIN DISORDERS, IMPAIRED LIVER, KIDNEY, OR PULMONARY FUNCTION, GLUCOSE 6-PHOSPHATE-DEHYDROGENASE DEFICIENCY, OR PRE-EXISTING WILSON'S DISEASE MAY BE MORE SUSCEPTIBLE TO THE EFFECTS OF THIS MATERIAL.



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PRODUCT: COPPER SULFATE NON FIFRA REGISTERED

ORDER NO: 221078

PROD NO : 681669

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#### 4. FIRST AID MEASURES

##### INHALATION:

REMOVE TO FRESH AIR. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN. CALL A PHYSICIAN.

##### INGESTION:

DO NOT INDUCE VOMITING IMMEDIATELY AS DIRECTED BY MEDICAL PERSONNEL. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON. CALL A PHYSICIAN IMMEDIATELY.

##### SKIN CONTACT:

IN CASE OF CONTACT, WIPE OFF EXCESS MATERIAL FROM SKIN THEN IMMEDIATELY FLUSH SKIN WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES. REMOVE CONTAMINATED CLOTHING AND SHOES. WASH CLOTHING BEFORE REUSE. CALL A PHYSICIAN.

##### EYE CONTACT:

IMMEDIATELY FLUSH EYES WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES, LIFTING LOWER AND UPPER EYELIDS OCCASIONALLY. GET MEDICAL ATTENTION IMMEDIATELY.

=====

#### 5. FIRE FIGHTING MEASURES

##### FIRE:

NOT CONSIDERED TO BE A FIRE HAZARD.

##### EXPLOSION:

NOT CONSIDERED TO BE AN EXPLOSION HAZARD. SEALED CONTAINER MAY RUPTURE DURING FIRE CONDITIONS FROM PRESSURE WATER VAPOR RELEASE.

##### FIRE EXTINGUISHING MEDIA:

USE ANY MEANS SUITABLE FOR EXTINGUISHING SURROUNDING FIRE. WATER SPRAY MAY BE USED TO KEEP FIRE EXPOSED CONTAINERS COOL.

##### SPECIAL INFORMATION:

IN THE EVENT OF A FIRE, WEAR FULL PROTECTIVE CLOTHING AND NIOSH-APPROVED SELF-CONTAINED BREATHING APPARATUS WITH FULL FACEPIECE OPERATED IN THE POSITIVE PRESSURE DEMAND OR OTHER POSITIVE PRESSURE MODE. WHEN HEATED ABOVE 110C (230F) MATERIAL WILL MELT. AVOID USING A DIRECT WATER STREAM ON MOLTEN MATERIAL AS IT MAY CAUSE SPLATTERING.

=====

PRODUCT: COPPER SULFATE NON FIFRA REGISTERED

ORDER NO: 221078  
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6. ACCIDENTAL RELEASE MEASURES

ENTILATE AREA OF LEAK OR SPILL. KEEP UNNECESSARY AND UNPROTECTED PEOPLE  
WAY FROM AREA OF SPILL. WEAR APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT AS  
PECIFIED IN SECTION 8. SPILLS: PICK UP AND PLACE IN A SUITABLE CONTAINER  
OR RECLAMATION OR DISPOSAL, USING A METHOD THAT DOES NOT GENERATE DUST. US  
EGULATIONS (CERCLA) REQUIRE REPORTING SPILLS AND RELEASES TO SOIL, WATER  
ND AIR IN EXCESS OF REPORTABLE QUANTITIES. THE TOLL FREE NUMBER FOR THE US  
OAST GUARD NATIONAL RESPONSE CENTER IS (800) 424-8802.

7. HANDLING AND STORAGE

EEP IN A TIGHTLY CLOSED CONTAINER, STORED IN A COOL, DRY, VENTILATED AREA.  
ROTECT AGAINST PHYSICAL DAMAGE, ISOLATE FROM INCOMPATIBLE SUBSTANCES.  
OLUTIONS ARE CORROSIVE TO MILD STEEL. CONTAINERS OF THIS MATERIAL MAY BE  
AZARDOUSS WHEN EMPTY SINCE THEY RETAIN PRODUCT RESIDUES (DUST, SOLIDS);  
BSERVE ALL WARNINGS AND PRECAUTIONS LISTED FOR THE PRODUCT.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

AIRBORNE EXPOSURE LIMITS:  
OSHA PERMISSIBLE EXPOSURE LIMIT (PEL):  
MG/M3 (TWA) FOR COPPER DUSTS & MISTS AS CU  
ACGIH THRESHOLD LIMIT VALUE (TLV):  
MG/M3 (TWA) FOR COPPER DUSTS & MISTS AS CU

ENTILATION SYSTEM:  
SYSTEM OF LOCAL AND/OR GENERAL EXHAUST IS RECOMMENDED TO KEEP EMPLOYEE  
XPOSURES BELOW THE AIRBORNE EXPOSURE LIMITS. LOCAL EXHAUST VENTILATION IS  
ENERALLY PREFERRED BECAUSE IT CAN CONTROL THE EMISSIONS OF THE CONTAMINANT  
T ITS SOURCE, PREVENTING DISPERSION OF IT INTO THE GENERAL WORK AREA.  
LEASE REFER TO THE ACGIH DOCUMENT, "INDUSTRIAL VENTILATION, A MANUAL OF  
ECOMMENDED PRACTICES", MOST RECENT EDITION, FOR DETAILS.

PERSONAL RESPIRATORS (NIOSH APPROVED):  
F THE EXPOSURE LIMIT IS EXCEEDED AND ENGINEERING CONTROLS ARE NOT  
EASIBLE, A HALF FACEPIECE PARTICULATE RESPIRATOR (NIOSH TYPE N95 OR BETTER  
ILTERS) MAY BE WORN FOR UP TO TEN TIMES THE EXPOSURE LIMIT OR THE MAXIMUM  
SE CONCENTRATION SPECIFIED BY THE APPROPRIATE REGULATORY AGENCY OR  
ESPIRATOR SUPPLIER, WHICHEVER IS LOWEST.. A FULL-FACE PIECE PARTICULATE  
ESPIRATOR (NIOSH TYPE N100 FILTERS) MAY BE WORN UP TO 50 TIMES THE  
XPOSURE LIMIT, OR THE MAXIMUM USE CONCENTRATION SPECIFIED BY THE  
PPROPRIATE REGULATORY AGENCY, OR RESPIRATOR SUPPLIER, WHICHEVER IS LOWEST.

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IF OIL PARTICLES (E.G. LUBRICANTS, CUTTING FLUIDS, GLYCERINE, ETC.) ARE PRESENT, USE A NIOSH TYPE R OR P FILTER. FOR EMERGENCIES OR INSTANCES WHERE THE EXPOSURE LEVELS ARE NOT KNOWN, USE A FULL-FACEPIECE POSITIVE-PRESSURE, AIR-SUPPLIED RESPIRATOR. WARNING: AIR-PURIFYING RESPIRATORS DO NOT PROTECT WORKERS IN OXYGEN-DEFICIENT ATMOSPHERES.

## SKIN PROTECTION:

WEAR PROTECTIVE GLOVES AND CLEAN BODY-COVERING CLOTHING.

## EYE PROTECTION:

WEAR CHEMICAL SAFETY GOGGLES. MAINTAIN EYE WASH FOUNTAIN AND QUICK-DRENCH FACILITIES IN WORK AREA.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: TRANSPARENT BLUE TRICLINIC CRYSTALS OR CRYSTALLINE GRANULES OR POWDER.

BOILING POINT: 150C (> 302F)  
DECOMPOSES WITH LOSS OF 5H2O

COLOR: COLORLESS.

MELTING POINT: 110C (230F) LOSES 4H2O @ THIS TEMPERATURE.

SOLUBILITY: 1.6G/100CC H2O @ 0C (32F)

VAPOR DENSITY (AIR=1): NO INFORMATION FOUND.

SPECIFIC GRAVITY: 2.8 @ 15.6C/4C

VAPOR PRESSURE (MM HG): NO INFORMATION FOUND.

FLAMMABILITY: 0 (0.2 M SOLUTION) (WATER=1): SLOWLY EFFLORESCENT.

VOLATILES BY VOLUME @ 21C (70F):

## 10. STABILITY AND REACTIVITY

## STABILITY:

STABLE UNDER ORDINARY CONDITIONS OF USE AND STORAGE.

## Hazardous Decomposition Products:

WHEN HEATED TO DECOMPOSITION CUPRIC OXIDE AND SULFUR OXIDE MAY FORM.

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HAZARDOUS POLYMERIZATION:  
ILL NOT OCCUR.

INCOMPATIBILITIES:  
SUBSTANCE WILL IGNITE HYDROXYLAMINE. SOLUTIONS ARE ACIDIC AND CAN REACT  
WITH MAGNESIUM TO EVOLVE FLAMMABLE HYDROGEN GAS. MAY REACT WITH ACETYLENE  
TO FORM DANGEROUS ACETYLIDES.

CONDITIONS TO AVOID:  
INCOMPATIBLES.

1. TOXICOLOGICAL INFORMATION

ACUTE RAT LD50: 300 MG/KG. INVESTIGATED AS A TUMORIGEN, MUTAGEN.

-----/CANCER LISTS/-----			
---NTP CARCINOGEN---			
INGREDIENT	KNOWN	ANTICIPATED	IARC CATEGORY
COPPER SULFATE (7758-98-7)	NO	NO	NONE

2. ECOLOGICAL INFORMATION

ENVIRONMENTAL FATE:  
DATA FOR ANHYDROUS MATERIAL UNLESS OTHERWISE NOTED. WHEN RELEASED INTO THE  
OIL, THIS MATERIAL IS NOT EXPECTED TO BIODEGRADE. WHEN RELEASED INTO THE  
OIL, THIS MATERIAL MAY LEACH INTO GROUNDWATER. WHEN RELEASED INTO WATER,  
THIS MATERIAL IS NOT EXPECTED TO BIODEGRADE. WHEN RELEASED INTO WATER, THIS  
MATERIAL IS NOT EXPECTED TO EVAPORATE SIGNIFICANTLY. THIS MATERIAL IS  
EXPECTED TO SIGNIFICANTLY BIOACCUMULATE. THIS MATERIAL HAS AN  
EXPERIMENTALLY-DETERMINED BIOCONCENTRATION FACTOR (BCF) OF GREATER THAN  
100. BIOACCUMULATION DATA FOR COPPER.

ENVIRONMENTAL TOXICITY:  
THIS MATERIAL IS EXPECTED TO BE VERY TOXIC TO AQUATIC LIFE. THE  
LC50/96-HOUR VALUES FOR FISH ARE LESS THAN 1 MG/L. THE LC50/72-HOUR VALUES  
FOR ALGAE ARE LESS THAN 1 MG/L. TOXICITY DATA FOR COPPER.

3. DISPOSAL CONSIDERATIONS

WASTE THAT CANNOT BE SAVED FOR RECOVERY OR RECYCLING SHOULD BE MANAGED IN AN

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APPROPRIATE AND APPROVED WASTE DISPOSAL FACILITY, PROCESSING, USE OR  
CONTAMINATION OF THIS PRODUCT MAY CHANGE THE WASTE MANAGEMENT OPTIONS.  
STATE AND LOCAL DISPOSAL REGULATIONS MAY DIFFER FROM FEDERAL DISPOSAL  
REGULATIONS.

DISPOSE OF CONTAINER AND UNUSED CONTENTS IN ACCORDANCE WITH FEDERAL, STATE  
AND LOCAL REQUIREMENTS.

1. TRANSPORT INFORMATION

DOMESTIC (LAND, D.O.T.)

OPER SHIPPING NAME: RQ, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID,  
N.O.S. (CUPRIC SULFATE)  
HAZARD CLASS: 9  
/NA: UN3077 PACKING GROUP: III  
INFORMATION REPORTED FOR PRODUCT/SIZE: 400LB

INTERNATIONAL (WATER, I.M.O.)

OPER SHIPPING NAME: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.  
(CUPRIC SULFATE)  
HAZARD CLASS: 9  
/NA: UN3077 PACKING GROUP: III  
INFORMATION REPORTED FOR PRODUCT/SIZE: 400LB

2. REGULATORY INFORMATION

-----/CHEMICAL INVENTORY STATUS - PART 1/-----  
INGREDIENT TSCA EC JAPAN AUSTRALIA  
CUPRIC SULFATE (7758-98-7) YES YES YES YES

-----/CHEMICAL INVENTORY STATUS - PART 2/-----  
--CANADA--  
INGREDIENT KOREA DSL NDSL PHIL.  
CUPRIC SULFATE (7758-98-7) YES YES NO YES

-----/FEDERAL, STATE & INTERNATIONAL REGULATIONS - PART 1/-----  
--SARA 302-----SARA 313-----  
INGREDIENT RQ TPQ LIST CHEMICAL CATG  
CUPRIC SULFATE (7758-98-7) NO NO NO COPPER COMPOUND

-----/FEDERAL, STATE & INTERNATIONAL REGULATIONS - PART 2/-----  
--RCRA-- TSCA--

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-----  
NGREDIENT CERCLA 261.33 8(D)  
UPRIC SULFATE (7758-98-7) 10 NO NO

HEMICAL WEAPONS CONVENTION: NO TSCA 12(B): NO CDTA: NO  
ARA 311/312: ACUTE: YES CHRONIC: YES FIRE: NO PRESSURE: NO  
EACTIVITY: NO (PURE/SOLID)

USTRALIAAN HAZCHEM CODE: NONE ALLOCATED.  
OISON SCHEDULE: S5

HMS: THIS MSDS HAS BEEN PREPARED ACCORDING TO THE HAZARD CRITERIA OF  
THE CONTROLLED PRODUCTS REGULATIONS (CPR) AND THE MSDS CONTAINS  
ALL OF THE INFORMATION REQUIRED BY THE CPR.

=====

#### 6. OTHER INFORMATION

FPA RATINGS:  
EALTH: 2 FLAMMABILITY: 0 REACTIVITY: 0

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----- FOR ADDITIONAL INFORMATION -----

CONTACT: MSDS COORDINATOR

UNIVAR USA INC.

DURING BUSINESS HOURS, PACIFIC TIME

(425)889-3400

03/29/04 14:34

PRODUCT: 681669

CUST NO: 113365

ORDER NO: 221078

----- NOTICE -----

\*\*\*\*\* UNIVAR USA INC("UNIVAR"), EXPRESSLY DISCLAIMS

ALL EXPRESS OR IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A

ARTICULAR PURPOSE, WITH RESPECT TO THE PRODUCT OR INFORMATION PROVIDED

HEREIN, AND SHALL UNDER NO CIRCUMSTANCES BE LIABLE FOR INCIDENTAL OR

CONSEQUENTIAL DAMAGES. \*\*

DO NOT USE INGREDIENT INFORMATION AND/OR PERCENTAGES IN THIS MSDS AS A  
PRODUCT SPECIFICATION. FOR PRODUCT SPECIFICATION INFORMATION REFER TO A PRODUCT  
SPECIFICATION SHEET AND/OR A CERTIFICATE OF ANALYSIS. THESE CAN BE OBTAINED FROM  
OUR LOCAL UNIVAR SALES OFFICE.

ALL INFORMATION APPEARING HEREIN IS BASED UPON DATA OBTAINED FROM THE  
MANUFACTURER AND/OR RECOGNIZED TECHNICAL SOURCES. WHILE THE INFORMATION IS  
BELIEVED TO BE ACCURATE, UNIVAR MAKES NO REPRESENTATIONS AS TO ITS ACCURACY OR  
EFFICIENCY. CONDITIONS OF USE ARE BEYOND UNIVAR'S CONTROL AND THEREFORE USERS  
ARE RESPONSIBLE TO VERIFY THIS DATA UNDER THEIR OWN OPERATING CONDITIONS TO  
DETERMINE WHETHER THE PRODUCT IS SUITABLE FOR THEIR PARTICULAR PURPOSES AND THEY  
ASSUME ALL RISKS OF THEIR USE, HANDLING, AND DISPOSAL OF THE PRODUCT, OR FROM  
THE PUBLICATION OR USE OF, OR RELIANCE UPON, INFORMATION CONTAINED HEREIN.  
THIS INFORMATION RELATES ONLY TO THE PRODUCT DESIGNATED HEREIN, AND DOES NOT  
RELATE TO ITS USE IN COMBINATION WITH ANY OTHER MATERIAL OR IN ANY OTHER  
PROCESS.

\*\*\* E N D O F M S D S \*\*\*

PRODUCT: POTASSIUM BROMIDE

ORDER NO: 226085  
PROD NO : 614395

PHOTOGRAPHERS FORMULARY  
CALL IN ADVANCE TO MEET  
7079 HWY 83 N.  
BOX 89  
CONDON , MT 59826

UNIVAR USA INC.  
6100 CARILLON POINT , KIRKLAND

(425)889-3400  
WA 98033

----- EMERGENCY ASSISTANCE -----

FOR EMERGENCY ASSISTANCE INVOLVING CHEMICALS CALL - CHEMTREC  
(800)424-9300

\*\*\*\*\*  
PRODUCT IDENTIFICATION  
\*\*\*\*\*

PRODUCT NAME: POTASSIUM BROMIDE

MSDS NUMBER: P21725VS

DATE ISSUED: 11/19/02

SUPERCEDES: NEW

ISSUED BY: 006137

REVIEWED DATE: 07/16/2004  
THIS MSDS HAS BEEN REVIEWED ON 07/16/2004, AND IS  
CURRENT AS OF THE DATE ISSUED ABOVE.

MATERIAL SAFETY DATA SHEET

1. IDENTIFICATION OF THE SUBSTANCE & THE COMPANY

CHEMICAL NAME POTASSIUM BROMIDE  
CHEMICAL FORMULA KBR  
MOLECULAR WEIGHT 120.98

TYPE OF PRODUCT AND USE



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MATERIAL SAFETY DATA SHEET

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FOR USE IN PHOTOGRAPHIC EMULSIONS AND DEVELOPING SOLUTIONS  
HEAT STABILIZER IN NYLON  
BROMINATING AGENT

COMPANY BROMINE COMPOUNDS LTD.  
P.O.B 180, BEER SHEVA 84101, ISRAEL  
TEL +972-8-6297830

SUPPLIER AMERIBROM, INC.  
2115 LINWOOD AVENUE, FORT LEE, NEW JERSEY 07024-5004  
USA TEL: 201 242 6560

EMERGENCY TELEPHONE CHEMTREC (800)424-9300

## 2. COMPOSITION / INFORMATION ON INGREDIENTS

COMPONENTS	WEIGHT %	ACGIH-TLV DATA	OSHA (PEL) DATA
POTASSIUM BROMIDE	99.5	NOT DETERMINED	NOT DETERMINED
7758-02-3			

## 3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW WHITE, ODOURLESS, CRYSTALLINE SOLID  
IRRITANT TO EYES

### POTENTIAL HEALTH EFFECTS:

- EYE CONTACT IRRITANT
- SKIN CONTACT NOT IRRITANT TO INTACT SKIN. SLIGHTLY IRRITANT ON PROLONGED CONTACT TO ABRADED SKIN.
- INHALATION MAY CAUSE IRRITATION TO MUCOUS MEMBRANES AND UPPER RESPIRATORY TRACT.
- INGESTION MAY CAUSE FALLING ASLEEP, MUSCULAR INCOORDINATION AND RESPIRATORY DEPRESSION.

ABDOMINAL PAIN, NAUSEA AND VOMITING.

## 4. FIRST-AID MEASURES

EYE CONTACT HOLDING THE EYELIDS APART, FLUSH EYES PROMPTLY WITH COPIOUS FLOWING WATER FOR AT LEAST 20 MINUTES.

GET MEDICAL ATTENTION IMMEDIATELY.

SKIN CONTACT REMOVE CONTAMINATED CLOTHING. WASH SKIN THOROUGHLY WITH MILD SOAP AND PLENTY OF WATER FOR AT LEAST 15 MINUTES. WASH CLOTHING BEFORE RE-USE.

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-----

GET MEDICAL ATTENTION IF IRRITATION OCCURS.

INHALATION IN CASE OF DUST INHALATION OR BREATHING FUMES RELEASED FROM HEATED MATERIAL, REMOVE PERSON TO FRESH AIR.

KEEP HIM QUIET AND WARM. APPLY ARTIFICIAL RESPIRATION IF NECESSARY AND GET MEDICAL ATTENTION IMMEDIATELY.

INGESTION IF SWALLOWED, WASH MOUTH THOROUGHLY WITH PLENTY OF WATER AND GIVE WATER TO DRINK.

GET MEDICAL ATTENTION IMMEDIATELY.

NOTE: NEVER GIVE AN UNCONSCIOUS PERSON ANYTHING TO DRINK.

NOTES TO THE PHYSICIAN IN CASE OF INGESTION INDUCE VOMITING IN ALERT PATIENT. NO SPECIFIC ANTIDOTE. TREAT SYMPTOMATICALLY AND SUPPORTIVELY.

#### 5 FIRE-FIGHTING MEASURES

FLASH POINT NONE

FLAMMABLE/EXPLOSION LIMITS NOT FLAMMABLE

AUTO-IGNITION TEMPERATURE NOT APPLICABLE

SUITABLE EXTINGUISHING MEDIA MATERIAL IS NOT COMBUSTIBLE. USE EXTINGUISHING MEDIA APPROPRIATE TO SURROUNDING FIRE CONDITIONS.

#### FIRE FIGHTING PROCEDURE

COOL CONTAINERS WITH WATER SPRAY. IN CLOSED STORES, PROVIDE FIRE-FIGHTERS WITH SELF-CONTAINED BREATHING APPARATUS IN POSITIVE PRESSURE MODE.

#### UNUSUAL FIRE AND EXPLOSION

HAZARDS WILL DECOMPOSE FROM CA. 800 C RELEASING POISONOUS AND CORROSIVE FUMES OF HBR.

#### 6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS WEAR RESPIRATOR, CHEMICAL SAFETY GOGGLES, RUBBER GLOVES AND BOOTS.

METHODS FOR CLEANING UP SWEEP UP, PLACE IN A BAG AND HOLD FOR WASTE DISPOSAL OR POSSIBLE RE-USE.

AVOID RAISING DUST.

VENTILATE AREA AND WASH SPILL SITE AFTER MATERIAL PICKUP IS COMPLETE.

#### 7. HANDLING AND STORAGE

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HANDLING AVOID BODILY CONTACT.

KEEP CONTAINERS TIGHTLY CLOSED.

STORAGE HYGROSCOPIC. AVOID EXPOSURE TO MOISTURE.

STORE IN A DRY, COOL, WELL-VENTILATED AREA AWAY FROM INCOMPATIBLE MATERIALS  
(SEE "MATERIALS TO AVOID").

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

VENTILATION REQUIREMENTS MECHANICAL EXHAUST REQUIRED.

VENTILATION MUST BE SUFFICIENT TO MAINTAIN TLV-TWA BELOW 10 MG/M3 (ACGIH  
RECOMMENDATION FOR PARTICULATES (INSOLUBLE) NOT OTHERWISE SPECIFIED (PNOS)).

## PERSONAL PROTECTIVE EQUIPMENT:

- RESPIRATORY PROTECTION DUST RESPIRATOR

HAND PROTECTION PVC GLOVES RUBBER GLOVES

- EYE PROTECTION CHEMICAL SAFETY GOGGLES

- SKIN AND BODY PROTECTION BODY COVERING CLOTHES AND BOOTS

HYGIENE MEASURES SAFETY SHOWER AND EYE BATH SHOULD BE PROVIDED. DO NOT EAT,  
DRINK OR SMOKE UNTIL AFTER-WORK SHOWERING AND CHANGING CLOTHES.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE WHITE, ODOURLESS, CRYSTALLINE SOLID

MELTING POINT/RANGE 734 C

BOILING POINT/RANGE 1435 C

VAPOUR PRESSURE 1 MM HG AT 795 C

VAPOR DENSITY NOT APPLICABLE UNDER STANDARD CONDITIONS

EVAPORATION RATE (ETHER=1) NOT APPLICABLE UNDER STANDARD CONDITIONS

## SOLUBILITY:

- SOLUBILITY IN WATER 65.5 G/100ML AT 20 C

102 GR/100ML AT 100 C

- SOLUBILITY IN OTHER SOLVENTS ALCOHOL: 0.142 G/100G AT 25 C

SPECIFIC GRAVITY 2.75

DECOMPOSITION TEMPERATURE FROM CA. 800 C

## 10. STABILITY AND REACTIVITY

STABILITY HYGROSCOPIC.

STABLE UNDER NORMAL CONDITIONS

MATERIALS TO AVOID STRONG OXIDANTS

STRONG ACIDS

HEAVY METAL SALTS

REACTS EXPLOSIVELY WITH BROMINE TRIFLUORIDE

CONDITIONS TO AVOID EXPOSURE TO MOISTURE

HEATING ABOVE DECOMPOSITION TEMPERATURE

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## HAZARDOUS DECOMPOSITION

PRODUCTS HBR

HAZARDOUS POLYMERIZATION WILL NOT OCCUR

## 11. TOXICOLOGICAL INFORMATION

## ACUTE TOXICITY:

- RAT ORAL LD50 > 5000 MG/KG
- EYE IRRITATION (RABBIT) IRRITANT
- DERMAL IRRITATION (RABBIT) NOT IRRITANT

CHRONIC TOXICITY REPEATED SKIN CONTACT MAY CAUSE DERMATITIS.  
REPEATED ORAL INTAKE OF BROMIDES (>9 MG/KG BODY WEIGHT/DAY) MAY AFFECT THE CENTRAL NERVOUS SYSTEM. WARNING SYMPTOMS INCLUDE MENTAL DULLNESS, SLURRED SPEECH, WEAKENED MEMORY, APATHY, ANOREXIA, CONSTIPATION, DROWSINESS AND LOSS OF SENSITIVITY TO TOUCH AND PAIN.

MUTAGENICITY NOT MUTAGENIC BY THE AMES TEST

CARCINOGENICITY NOT KNOWN TO BE A CARCINOGEN.  
NOT CLASSIFIED BY IARC.  
NOT INCLUDED IN NTP 9TH REPORT ON CARCINOGENS.

## 12. ECOLOGICAL INFORMATION

ENVIRONMENTAL FATE KBR IS AN INORGANIC SALT, WHICH FULLY DISSOCIATES IN AQUATIC ENVIRONMENT TO BROMIDE AND POTASSIUM IONS. IT ALSO UNDERGOES DEGRADATION IN SOIL TO BROMIDE ION (NO FURTHER DEGRADATION OR BIODEGRADATION WILL OCCUR).

## AQUATIC TOXICITY:

- LC50, FISH 3200 MG/L, 5 DAYS (RAINBOW TROUT)
- 48 HOUR-EC50, DAPHNIA MAGNA >100 MG/L

## AVIAN TOXICITY:

- ORAL LD50, BOBWHITE QUAIL >2500 MG/KG
- DIETARY LC50, BOBWHITE QUAIL 6000 PPM

BIOACCUMULATIVE POTENTIAL BIOACCUMULATION IS NOT LIKELY TO OCCUR SINCE THIS MATERIAL IS HIGHLY SOLUBLE IN WATER.

## 13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL ADD INTO A LARGE VESSEL CONTAINING WATER AND DRAIN INTO SEWER WITH AMPLE WATER. OBSERVE ALL FEDERAL, STATE AND LOCAL ENVIRONMENTAL REGULATIONS WHEN DISPOSING OF THIS MATERIAL.

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#### 14. TRANSPORTATION INFORMATION

DOT NOT REGULATED  
IMO NOT REGULATED  
ICAO/IATA NOT REGULATED

#### 15. REGULATORY INFORMATION

USA REPORTED IN THE EPA TSCA INVENTORY

CANADA LISTED IN DSL

EEC NO. 231-830-3

JAPAN LISTED IN MITI (1-108)

AUSTRALIA LISTED IN AICS

CHINA INVENTORY LISTED

SOUTH KOREA LISTED IN ECL (KE-29079)

SWITZERLAND GIFTKLASSE 3

PHILIPPINES LISTED IN PICCS

#### 16. OTHER INFORMATION

THIS DATA SHEET CONTAINS CHANGES FROM THE PREVIOUS VERSION IN SECTION(S)  
8,15

THE HSE POLICY OF DEAD SEA BROMINE GROUP

DEAD SEA BROMINE GROUP (DSBG) IS THE WORLD'S LARGEST PRODUCER OF ELEMENTAL BROMINE AND A RECOGNIZED LEADER IN THE DEVELOPMENT AND SUPPLY OF BROMINE COMPOUNDS.

DSBG IS COMMITTED TO RESPONSIBLY MANAGE ITS PRODUCTS AT ALL STAGES OF THEIR LIFE CYCLE IN ORDER TO PROTECT HUMAN HEALTH AND THE ENVIRONMENT. THIS RESPONSIBILITY APPLIES THROUGHOUT DEVELOPMENT, MANUFACTURE, TRANSPORTATION, USE, RECYCLE AND DISPOSAL OF DSBG PRODUCTS.

WITHIN THIS FRAMEWORK DSBG IS COMMITTED TO:

- \* COMPLY WITH NATIONAL AND INTERNATIONAL REGULATORY REQUIREMENTS
- \* CONFORM TO THE ISO 14001 AND OHSAS 18001 REQUIREMENTS FOR ENVIRONMENTAL AND OCCUPATIONAL HEALTH & SAFETY MANAGEMENT SYSTEMS AND PERIODICALLY EVALUATE PERFORMANCE AS PART OF THE COMPANY'S EXISTING QUALITY AUDITS SYSTEM
- \* DESIGN PRODUCTS AND PROCESSES WHICH PREVENT RISK TO HEALTH AND THE ENVIRONMENT AT PRODUCTION SITES AND ALONG THE SUPPLY CHAIN
- \* IMPROVE EFFICIENCY IN USE OF ENERGY & NATURAL RESOURCES, PROMOTE RECYCLING AND WASTE MANAGEMENT THROUGH SAFE & ENVIRONMENTALLY SOUND END OF LIFE

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PROGRAMS

- \* WORK FOR CONTINUAL IMPROVEMENT IN HSE PERFORMANCE
- \* REGULARLY ASSESS AND RESPONSIBLY MANAGE HEALTH, SAFETY AND ENVIRONMENTAL RISKS ASSOCIATED WITH PRODUCTS AND PROCESSES
- \* EDUCATE AND TRAIN ALL MANAGERS AND EMPLOYEES TO IMPROVE THEIR HSE PERFORMANCE
- \* DISTRIBUTE UPDATED INFORMATION CONCERNING ITS POLICY AND PRODUCTS TO ITS WORKERS, CUSTOMERS AND OTHER INTERESTED PARTIES THROUGH MATERIAL SAFETY DATA SHEET (MSDS), WORKERS' SAFETY SHEETS AND THROUGH THE DSBG INTERNET SITE
- \* DEVELOP BUSINESS RELATIONSHIPS WITH RESPONSIBLE SUPPLIERS, TRANSPORTERS AND DISTRIBUTORS AND PROVIDE THEM WITH HSE SUPPORT, INFORMATION AND TRAINING
- \* SUPPORT PRODUCT STEWARDSHIP PROGRAMS IN COOPERATION WITH CUSTOMERS, DISTRIBUTORS AND TRANSPORTERS
- \* ALLOCATE THE NECESSARY RESOURCES FOR IMPLEMENTATION OF THIS POLICY

PREPARED BY HSE DIVISION IN ISRAEL

TELEPHONE: +/972-8-6297830

TELEFAX: +/972-8-6297832

WWW.DSBG.COM

END OF SAFETY DATA SHEET

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----- FOR ADDITIONAL INFORMATION -----

CONTACT: MSDS COORDINATOR                      UNIVAR USA INC.  
                 DURING BUSINESS HOURS, PACIFIC TIME                      (425)889-3400

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\* \* \*    E N D   O F   M S D S    \* \* \*

MAY 15 1998

GARDENA, CA  
NEW BRUNSWICK, NJ

# Material Safety Data Sheet

NFPA	HMIS	Personal Protective Equipment						
	<table><tr><td>Health Hazard</td><td>2</td></tr><tr><td>Fire Hazard</td><td>1</td></tr><tr><td>Reactivity</td><td>0</td></tr></table>	Health Hazard	2	Fire Hazard	1	Reactivity	0	 See Section 15 .....
Health Hazard	2							
Fire Hazard	1							
Reactivity	0							

## Section 1. Chemical Product and Company Identification

Page Number: 1

Common Name/ Trade Name	<b>Succinic acid</b>	Code	S5040
Manufacturer	SPECTRUM CHEMICAL MFG. CORP. 14422 SOUTH SAN PEDRO STREET GARDENA, CALIFORNIA 90248	CAS#	110-15-6
Commercial Name(s)	Not available.	RTECS	WM4900000
Synonym	Butanedioic acid	TSCA	On the TSCA list.
Chemical Name		CI#	Not available.
Chemical Family	Not available.	<b>IN CASE OF EMERGENCY</b> <b>CHEMTREC (24hr) 800-424-9300</b> Emergency phone: (310)516-8000	
Chemical Formula	(CH <sub>2</sub> COOH) <sub>2</sub>		
Supplier	SPECTRUM QUALITY PRODUCTS, INC. 14422 SOUTH SAN PEDRO STREET GARDENA, CA 90248		

## Section 2. Composition and Information on Ingredients

		Exposure Limits			
Name	CAS #	TWA (mg/m <sup>3</sup> )	STEL (mg/m <sup>3</sup> )	CEIL (mg/m <sup>3</sup> )	% by Weight
Succinic acid	110-15-6				100

Toxicological Data on Ingredients      **Succinic acid**  
 LD50: Not available.  
 LC50: Not available.

## Section 3. Hazards Identification

Potential Acute Health Effects	Slightly dangerous to dangerous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation. This product may irritate eyes and skin upon contact.
Potential Chronic Health Effects	<b>CARCINOGENIC EFFECTS:</b> Not available. <b>MUTAGENIC EFFECTS:</b> Not available. <b>TERATOGENIC EFFECTS:</b> Not available. Toxicity of the product to the reproductive system: Not available. There is no known effect from chronic exposure to this product. Repeated or prolonged exposure is not known to aggravate medical condition.

Continued on Next Page



**Section 4. First Aid Measures**

Eye Contact	Check for and remove any contact lenses. IMMEDIATELY flush eyes with running water for at least 15 minutes, keeping eyelids open. COLD water may be used. DO NOT use an eye ointment. Seek medical attention.
Skin Contact	If the chemical got onto the clothed portion of the body, remove the contaminated clothes as quickly as possible, protecting your own hands and body. Place the victim under a deluge shower. If the chemical touches the victim's exposed skin, such as the hands: Gently and thoroughly wash the contaminated skin with running water and non-abrasive soap. Be particularly careful to clean folds, crevices, creases and groin. COLD water may be used. Cover the irritated skin with an emollient. If irritation persists, seek medical attention. Wash contaminated clothing before reusing.
Serious Skin Contact	Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek medical attention.
Inhalation	Allow the victim to rest in a well ventilated area. Seek immediate medical attention.
Serious Inhalation	No additional information.
Ingestion	Remove dentures if any. Have conscious person drink several glasses of water or milk. INDUCE VOMITING by sticking finger in throat. Lower the head so that the vomit will not reenter the mouth and throat. NEVER give an unconscious person anything to ingest. Seek medical attention.
Serious Ingestion	No additional information.

**Section 5. Fire and Explosion Data**

Flammability of the Product	Combustible.
Auto-Ignition Temperature	Not available.
Flash Points	OPEN CUP: 160°C (320°F)
Flammable Limits	Not available.
Products of Combustion	These products are carbon oxides (CO, CO <sub>2</sub> ).
Fire Hazards in Presence of Various Substances	No specific information is available in our database regarding the flammability of this product in presence of various materials.
Explosion Hazards in Presence of Various Substances	Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available. No specific information is available in our database regarding the product's risks of explosion in the presence of various materials.
Fire Fighting Media and Instructions	SMALL FIRE: Use DRY chemicals, CO <sub>2</sub> , water spray or foam. LARGE FIRE: Use water spray, fog or foam. DO NOT use water jet.
Special Remarks on Fire Hazards	No additional remark.
Special Remarks on Explosion Hazards	No additional remark.

**Section 6. Accidental Release Measures**

Small Spill	Use appropriate tools to put the spilled solid in a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.
Large Spill	Our database contains no additional information in case of a spill and/or a leak of the product. Use a shovel to put the material into a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system.

**Section 7. Handling and Storage**

Precautions	Keep away from heat. Keep away from sources of ignition. Empty containers pose a fire risk, evaporate the residue under a fume hood. Ground all equipment containing material. DO NOT breathe dust. In case of insufficient ventilation, wear suitable respiratory equipment. If you feel unwell, seek medical attention and show the label when possible. Avoid contact with skin and eyes.
Storage	Keep container dry. Keep in a cool place. Ground all equipment containing material. Keep container tightly closed. Keep in a cool, well-ventilated place. Combustible materials should be stored away from extreme heat and away from strong oxidizing agents.

**Section 8. Exposure Controls/Personal Protection**

Engineering Controls	Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.
Personal Protection	Splash goggles. Lab coat. Dust respirator. Be sure to use a MSHA/NIOSH approved respirator or equivalent. Gloves (impervious).
Personal Protection in Case of a Large Spill	Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.
Exposure Limits	Not available.

**Section 9. Physical and Chemical Properties**

Physical state and appearance	Solid.	Odor	Not available.
Molecular Weight	118.09	Taste	Not available.
pH (1% soln/water)	Not available.	Color	Not available.
Boiling Point	Decomposes. (235 °C or 455°F)		
Melting Point	188°C (370.4°F)		
Critical Temperature	Not available.		
Specific Gravity	1.56 (Water = 1)		
Vapor Pressure	Not available.		
Vapor Density	Not available.		
Volatility	Not available.		
Odor Threshold	Not available.		
Water/Oil Dist. Coeff.	Not available.		
Ionicity (in Water)	Not available.		
Dispersion Properties	See solubility in water.		
Solubility	Partially soluble in cold water.		

**Section 10. Stability and Reactivity Data**

Stability	The product is stable.
Instability Temperature	Not available.
Conditions of Instability	No additional remark.
Incompatibility with various substances	No specific information is available in our database regarding the reactivity of this material in presence of various other materials.
Corrosivity	Non-corrosive in presence of glass.
Special Remarks on Reactivity	No additional remark.
Special Remarks on Corrosivity	No additional remark.
Polymerization	No.

**Section 11. Toxicological Information**

Routes of Entry	Ingestion. Inhalation.
Toxicity to Animals	LD50: Not available. LC50: Not available.
Chronic Effects on Humans	Toxicity of the product to the reproductive system: Not available.
Other Toxic Effects on Humans	Slightly dangerous to dangerous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation.
Special Remarks on Toxicity to Animals	No additional remark.
Special Remarks on Chronic Effects on Humans	No additional remark.
Special Remarks on other Toxic Effects on Humans	No additional remark.

**Section 12. Ecological Information**

Ecotoxicity	Not available.
BOD5 and COD	Not available.
Products of Biodegradation	These products are carbon oxides (CO, CO2).
Toxicity of the Products of Biodegradation	The products of degradation are more toxic.
Special Remarks on the Products of Biodegradation	No additional remark.

**Section 13. Disposal Considerations**

Waste Disposal	Recycle to process, if possible. Consult your local or regional authorities.
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**Section 14. Transport Information**

DOT Classification Not a DOT controlled material (United States).

Identification Not applicable (PIN and PG).

Special Provisions for Transport Not applicable.

DOT (Pictograms)

**Section 15. Other Regulatory Information and Pictograms**

Federal and State Regulations The following product(s) is (are) listed on TSCA: Succinic acid

California Proposition 65 Warnings WARNING: This product contains a chemical known to the State of California to cause cancer.  
Chemical ingredient(s) requiring this warning:

NONE

WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.  
Chemical ingredient(s) requiring this warning:

NONE

Other Regulations OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).  
CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA): This product is on the Domestic Substances List (DSL), and is acceptable for use under the provisions of CEPA.

Other Classifications WHMIS (Canada) Not controlled under WHMIS (Canada).

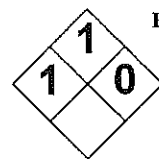
DSCL (EEC) Not controlled under DSCL (Europe).

HMIS (U.S.A.)

Health Hazard	2
Fire Hazard	1
Reactivity	0
Personal Protection	(e)

National Fire Protection Association (U.S.A.)

Health



Flammability

Reactivity

Specific hazard

WHMIS (Canada) (Pictograms)



DSCL (Europe) (Pictograms)



TDG (Canada) (Pictograms)



ADR (Europe)  
(Pictograms)Protective  
Equipment

Gloves (impervious).



Lab coat.

Dust respirator. Be sure to use a  
MSHA/NIOSH approved respirator  
or equivalent.

Splash goggles.

**Section 16. Other Information**

Catalog Number(s) S1685, S1686

References Not available.

Other Special No additional remark.  
Considerations

Validated by E. Brull on 12/17/96.

Verified by E. Brull.

Printed 12/18/96.

Emergency phone: (310)516-8000

**Notice to Reader**

All chemicals may pose unknown hazards and should be used with caution. This Material Safety Data Sheet (MSDS) applies only to the material as packaged. If this product is combined with other materials, deteriorates, or becomes contaminated, it may pose hazards not mentioned in this MSDS. It shall be the user's responsibility to develop proper methods of handling and personal protection based on the actual conditions of use. While this MSDS is based on technical data judged to be reliable, Spectrum Quality Products, Inc. assumes no responsibility for the completeness or accuracy of the information contained herein.