

PHOTOGRAPHERS' FORMULARY

PHOTOGRAPHERS' FORMULARY KALLITYPE PRINTING KIT

Kallotype printing is similar to platinum and palladium printing in theory and technique. However, the Kallotype printing process uses the less expensive silver salt in place of platinum or palladium salts. Good Kallotypes have a platinum-like quality. Print color can be controlled by development. Sufficient chemicals for black, brown, or sepia development are included in this kit.

CHEMICALS CONTAINED IN THIS KIT

This kit contains the following chemicals:

Chemical	Amount
Arrowroot starch	20 g
Ferric oxalate	30 ml
Silver nitrate	2 g
Rochelle salt	100 g
Borax	75 g
Potassium oxalate	60 g
Sodium thiosulfate, pentahydrate	50 g
Ammonia (28%)	15 ml
Potassium dichromate	5 g

CHEMICAL SAFETY

PLEASE USE DISTILLED WATER FOR ALL SOLUTIONS

All chemicals are dangerous and must be treated with respect. Please read the chemical warning on each package of chemical. Consult with local sewer and water authorities regarding proper disposal of darkroom chemicals in your area.












There are four chemicals in this kit that need special attention: silver nitrate, potassium oxalate, ammonia, and potassium dichromate. A separate discussion of the safety and characteristics of ferric oxalate follows this section.

Silver Nitrate is both an oxidizer (fire hazard) and a caustic (can cause skin burns). Clean up any spilled solid silver nitrate with water and dispose of any excess down the drain. Never dispose of solid silver nitrate in a wastepaper basket.

If solid silver nitrate comes into contact with the skin, a chemical burn may result. Wash the area with cold water followed by soap and water. Treat a chemical burn in the same manner you would a heat burn.

When dilute solutions of silver nitrate are spilled on the skin, a brown to brown-black stain results. The color is due to silver metal bound to the protein of the skin and cannot be washed off. While there are chemical methods for removing the brown stains, the best procedure is to just let them wear off.

Material Safety Data Sheet

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

Section 1. Chemical Product and Company Identification

Common Name/ Trade Name	Starch <i>Arrowroot Starch</i>	Code	S4830
Manufacturer	SPECTRUM CHEMICAL MFG. CORP. 14422 SOUTH SAN PEDRO STREET GARDENA, CALIFORNIA 90248-9985	CAS#	9005-25-8
Commercial Name(s)	Not available	RTECS	GM5090000
Synonym	Not available.	TSCA	On the TSCA list.
Chemical Name	Not available. <i>Arrowroot Starch</i>	CI#	Not available.
Chemical Family	Not available.	In case of emergency CHEMTREC (24hr) 800-424-9300 Emergency phone: (310) 516-8000	
Chemical Formula	Not available.		
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
Starch	9005-25-8				100

Toxicological Data on Ingredients Starch:

Section 3. Hazards Identification

Potential Acute Health Effects Very slightly to slightly dangerous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation.

Potential Chronic CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. Toxicity of the product to the reproductive system: Not available. There

**Health
Effects**

is no known effect from chronic exposure to this product. Repeated or prolonged exposure is not known to aggravate medical condition.

Section 4. First Aid Measures

**Eye
Contact**

NO known EFFECT on eye contact, rinse with water for a few minutes.

**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. Cover the irritated skin with an emollient. If irritation persists, seek medical attention. Wash contaminated clothing before reusing.

**Hazardous
Skin
Contact**

No additional information.

Inhalation

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

**Hazardous
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.

**Hazardous
Ingestion**

No additional information.

Section 5. Fire and Explosion Data

Flammability of the Product

Combustible.

Auto-Ignition Temperature

Not available.

Flash Points

Not available.

Flammable Limits

Not available.

Products of Combustion	Not available.
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 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, CO2, 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.
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	Safety glasses. Lab coat.
Personal	Splash goggles. Full suit. Boots. Gloves. Suggested protective clothing might not be sufficient;

Protection in
Case of a
Large Spill

Exposure Limits TWA: 10 (mg/m³) from ACGIH [1995] Consult local authorities for acceptable exposure limits.

Section 9. Physical and Chemical Properties

Physical state and appearance	Solid.	Odor	Not available.
Molecular Weight	Not available.	Taste	Not available.
pH (1% soln/water)	Not available.	Color	Not available.
Boiling Point	Not available.		
Melting Point	Decomposes.		
Critical Temperature	Not available.		
Specific Gravity	Not available.		
Vapor Pressure	Not available.		
Vapor Density	Not available.		
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	Not available.		
Solubility	Not available.]		

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.
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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**

Very slightly to slightly 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**

Nuisance dust.

Section 12. Ecological Information

Ecotoxicity

Not available.

BOD5 and COD

Not available.

**Products of
Biodegradation**

Not available.

**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.

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

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:

NONE

Pennsylvania 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:

Starch

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:

NONE

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:

NONE

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)

DSCL (EEC)

Other Classifications

WHMIS (Canada)

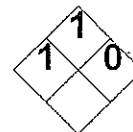
DSCL (EEC)

HMIS (U.S.A.)

Health Hazard	<input type="radio"/>
Fire Hazard	<input checked="" type="radio"/>
Reactivity	<input checked="" type="radio"/>
Personal Protection	<input type="radio"/>

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

Health



Flammability

Reactivity

Specific hazard

Personal Protective Equipment



Lab coat.



Safety glasses.

Section 16. Other Information

References Not available.

Catalog Number(s) S1551, S1552, S1553, S1554, S1557

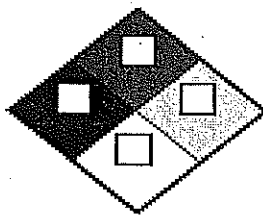
Other Special Considerations No additional remark.

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.



10-0530 f
10-0535

Material Safety Data Sheet
May be used to comply with
OSHA's Hazard Communication Standard
29 CFR 1910.1200 Standard must be
Consulted for specific requirements

U.S. Department of Labor
Occupational Safety And Health Administration
(Non-Mandatory Form)
Form Approved
OMB No. 1218-0072

Identity (as used on label and list) Ferric Oxalate Tri Potassium Salt		Note: Blank spaces are permitted, if any item is not applicable, or no information is available, the space must be marked to indicate that.
Section I		
Manufacturer's Name: Photographers' Formulary		Emergency Telephone Number: 1-800-424-9300
Address (Number Street, City, State and Zip): Po Box 950 Condon MT 59826		Telephone Number for Information: 406-754-2891 / 800-922-5255
		Date Prepared: 10-13-2004

Section II -- Hazardous Ingredients/Identity Information

Hazardous components (Specific Chemical Identity: Common Name(s))	OSHA PEL	ACGIH TLV	Other Limits	% Optional
Ferric Chloride FeCl3	N/A	1mg/m3		21% +/-
CAS # 7705-08-0				
Potassium Oxalate K2C2O4 H2O	N/A	N/A		79% +/-
CAS # 6487-48-5				

Section III -- Physical/Chemical Characteristics:

Boiling Point:	N/A	Specific Gravity:	N/A
Vapor Pressure: (mm Hg)	N/A	Melting Point	N/A
Vapor Density (AIR=1)	N/A	Evaporation Rate (Butyl Acetate =1)	N/A
Solubility in Water: Very			
Appearance and Order: Liquid or Green Crystals -- Will turn blue in light			

Section IV -- Fire and Explosion Hazard Data

Flash Point (Method Used)	Flammable Limits	LEL	UEL
Extinguishing Media: Non- Flammable			
Special Fire Fighting Procedures:			
Unusual Fire and Explosion Hazards: N/A			

Section V – Reactivity Data

Stability	Unstable	X	Conditions to Avoid: Light will cause it to lose sensitivity
	Stable		

Incompatibility (Materials to Avoid)

Hazardous Polymerization	May Occur		Conditions to Avoid:
	Will Not Occur	X	

Section VI – Health Hazard Data

Route(s) of Entry: Eyes	Inhalation: Yes	Skin: No	Ingestion: Yes
Health Hazards (Acute and Chronic) Dust irritating to eyes, nose, lungs, throat and stomach.			
Will stain skin			
Carcinogenicity: No	NTP: No	IASC Monographs: No	OSHA Regulated: Yes
Signs and symptoms of Exposure: Eyes will become red and burn, nose and lungs will burn, can cause A cough. Ingestion will burn the stomach.			
Medical Conditions Generally Aggravated by Exposure: None			
Emergency and First Aid Procedures: Wash skin and eyes with excessive amounts of water, may need o If to much is inhaled: If ingested induce vomiting, then drink milk.			

Section VII – Precautions for safe Handling and Use:

Steps to be taken in case Material IS Released or Spilled: Sweep and dispose in a waste container.
Waste Disposal Method: Can use local dumping center or wash down the drain.
Precautions to be Taken in Handling And Storing: Keep from light, keep cool and tightly sealed.
Other Precautions: None

Section VIII – Control Measures

Respiratory Protection (Specify Type) Dust Mask		
Ventilation	Local Exhaust: Yes	Special: NO
	Mechanical: Yes	Other: No
Protective Gloves: Rubber Gloves		Eye Protection: Goggles
Other Protective Clothing or Equipment: Apron		
Work/ Hygienic Practices: Wash any dust from the skin		



COLUMBUS CHEMICAL INDUSTRIES INC.

P.O. BOX 32
COLUMBUS, WISCONSIN 53925-0032

(920) 623-2140
FAX (920) 623-2517

Material Safety Data Sheet

May be used to comply with OSHA's Hazard Communication Standard, 29 CFR 1910.1200. Standard must be consulted for specific requirements

U.S. Department of Labor

Occupational Safety and Health Administration
(Non-Mandatory Form)
Form Approved
OMB No. 1218-0072

IDENTITY (as Used on Label and List)

Silver Nitrate

Note: Blank spaces are not permitted. If any item is not applicable or no information is available, the space must be marked to indicate that.

Section I

Manufacturers /Distributor Address Number Street City State and Zip Code

Columbus Chemical Industries, Inc.

N4335 Temkin Road

Columbus, WI 53925

Emergency Telephone Number

CHEMTREC 1-800-424-9300

Telephone Number for Information

(920) 623-2140

Date Prepared

01/06/2004

Signature of Preparer (optional)

Section II - Hazardous Ingredients/Identity Information

Hazardous Components (Specific Chemical Identity, Common Name(s))	CAS #	OSHA PEL	ACGIH TLV	Other Limits Recommended	% (optional)
Silver Nitrate*	7761-88-8	0.01 mg/m ³ TWA	0.01 mg/m ³ TWA	Not available	>99%

*Subject to the reporting requirements of SARA Title III Section 313.

Section III - Physical/Chemical Characteristics

Boiling Point	Decomposes @	440 °C (824 °F)	Specific Gravity (H ₂ O = 1)	4.35
Vapor Pressure (mm Hg)		Not available	Melting Point	212 °C (413.6 °F)
Vapor Density (AIR = 1)		5.8	Evaporation Rate (Butyl Acetate = 1)	Not available

Solubility in Water

122 g / 100 cc water @ 0 °C (32 °F)

Appearance and Odor

Colorless to white, odorless crystals.

Section IV Fire and Explosion Hazard Data

Flash Point (Method Used)

Nonflammable

Extinguishing Media

Use extinguishing media appropriate for surrounding fire.

Special Fire Fighting Procedures

Firefighters should wear proper protective equipment and self-contained breathing apparatus with full facepiece operated in positive pressure mode.

Unusual Fire and Explosion Hazards

Toxic gas of nitrogen oxides and silver oxides may be produced.

Flammable Limits

LEL

Not applicable

UEL

Not applicable

Section V Reactivity Data

Stability	Unstable		Conditions to Avoid	Light, incompatibles, heat
	Stable	X		and oxygen gas.

Incompatibility Materials to Avoid

Combustible materials, bromine trifluoride and trichloride, calcium carbide, magnesium, phosphine, strong reducing agents.

Hazardous Decomposition or Byproducts

Oxides of nitrogen, silver oxides.

Hazardous Polymerization**Conditions to Avoid**

	May Occur		Not applicable.
	Will Not Occur	X	

Section VI Health Hazard Data

Routes of Entry	Inhalation ?	Skin ?	Ingestion ?
	X	X	X

Health Hazards (Acute and Chronic)

SKIN: May cause irritation and may be harmful if absorbed. EYE: Causes eye irritation. INHALATION: May be

Material is irritating to the mucous membranes and upper respiratory tract. May cause severe irritation. INGESTION:

harmful if swallowed. Toxic to lungs and mucous membranes. Acute oral toxicity: LD₅₀ (MOUSE): 50 mg/kg.

Carcinogenicity	NTP	IARC Monographs	OSHA REGULATED?
	Not listed	Not listed	Not listed

Signs and Symptoms of Exposure.

EYES: Reddening, tearing, irritation, blindness. SKIN: Skin rash, pain, burns, reddening, dermatitis, ulcerations.

INGESTION: Gastrointestinal pain, diarrhea, nausea, vomiting. INHALATION: Coughing, choking, shortness of breath.

Medical Conditions Generally Aggravated by Exposure

Medical conditions that may be aggravated by exposure to this product include:

Conjunctivitis of the eye, dermatitis of the skin, asthma, emphysema and other respiratory diseases.

Emergency and First Aid Procedures

INGESTION: Wash out mouth with water provided person is conscious. DO NOT INDUCE

VOMITING. Call a physician immediately. INHALATION: Remove to fresh air. If not breathing give artificial respiration.

If breathing is difficult, give oxygen. SKIN: Flush with water for at least 15 minutes. Remove contaminated clothing;

call a physician. EYES: Flush with large amounts of water for at least 15 minutes, lifting lower and upper eyelids.

Section VII Precautions for Safe Handling and Use**Steps to be Taken in Case Material is Released or Spilled**

Evacuate area. Wear NIOSH/MSHA-approved respirator, chemical-resistant goggles,

rubber boots, apron and rubber gloves. Sweep up, place in a plastic container and hold for waste disposal. Avoid raising dust. Ventilate and wash spill area when complete. Prevent release to environment.

Waste Disposal Method Dispose in accordance with all applicable Federal, state and local regulations.

Precautions to be Taken in Handling and Storing

Store in a cool, dry, well-ventilated area in tightly-closed, plainly-labelled containers. Store in a corrosion-resistant container. Protect against physical damage, air and light. Maintain adequate ventilation. Wash thoroughly after handling. Do not ingest or breathe dust. Protect exposed tissues.

Other Precautions

Containers, even when empty, will retain residue and vapors. Always obey hazard warnings and handle empty containers as if they were full. Do not store near combustible materials.

Section VII Control Measures**Respiratory Protection (Specify Type)**

NIOSH/MSHA-approved respirator with dust/mist cartridge.

Ventilation

Local Exhaust Necessary.

Special Eyewash nearby.

Mechanical (General) Recommended.

Other Safety shower nearby.

Protective Gloves Appropriate chemical-resistant gloves.

Eye Protection safety goggles

Other Protective Clothing or Equipment Lab coat or apron, boots.

Work /Hygienic Practices Contact lenses should not be worn when working with this material. Wash exposed areas thoroughly

after handling. Avoid contact with eyes, skin and clothing. Avoid prolonged or repeated exposure. Do not ingest

or breathe dust. Wash contaminated clothing before reuse. Wash hands prior to eating or smoking.

Columbus Chemical Industries, Inc. ("Columbus") believes that the information herein is factual but it is not intended to be all inclusive. The information relates only to the specific Material designated and does not relate to its use in combination with other materials or its use as to any particular process. Because safety standards and regulations are subject to change and because Columbus has no continuing control over the Material, those handling, storing or using the Material should satisfy themselves that they have current information regarding the particular way the Material is handled, stored and used and that the same is done in accordance with federal, state and local law. COLUMBUS MAKES NO WARRANTY, EXPRESS OR IMPLIED, INCLUDING (WITHOUT LIMITATION) WARRANTIES WITH RESPECT TO THE COMPLETENESS OR CONTINUING ACCURACY OF THE INFORMATION CONTAINED HEREIN OR WITH RESPECT TO FITNESS FOR ANY PARTICULAR USE.

REPORT NUMBER: 703

UNIVAR USA INC.

PAGE: 001

MSDS NO: P22016VS

MATERIAL SAFETY DATA SHEET

MAINFRAME UPLOAD DATE: 06/04/03

VERSION: 002

PRODUCT: ROCHELLE SALTS

ORDER NO: 236182

PROD NO : 601333

PHOTOGRAPHERS FORMULARY

CALL IN ADVANCE TO MEET

7079 HWY 83 N.

BOX 89

CONDON , MT 59826

UNIVAR USA INC.

(425)889-3400

6100 CARILLON POINT , KIRKLAND

, WA 98033

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

FOR EMERGENCY ASSISTANCE INVOLVING CHEMICALS CALL - CHEMTREC

(800)424-9300

PRODUCT NAME: ROCHELLE SALTS

MSDS NUMBER: P22016VS

EFFECTIVE DATE: 1/16/2003

SUPERSEDES: 2/1998

ISSUED BY: 005896

IDENTITY (As used on Label and List)

Potassium Sodium Tartrate Rochelle Salts

C.A.S.# 6381-59-5

SECTION I

Distributed by:

Univar USA Inc.

6100 Carillon Point

Kirkland, WA 98033

425-889-3400

SECTION II - Hazardous Ingredients/Identity Information

Hazardous Components Potassium Sodium Tartrate

REPORT NUMBER: 703

UNIVAR USA INC.

PAGE: 002

MSDS NO: P22014VS

MATERIAL SAFETY DATA SHEET

MAINFRAME UPLOAD DATE: 06/04/03

VERSION: 002

PRODUCT: ROCHELLE SALTS

ORDER NO: 236182

PROD NO : 601333

Common Names Rochelle Salt

OSHA PEL N/A

ACGIH TLV N/A

Other Limits N/A

% (Opt.) 99%-100%

Section 313 Supplier Notification

This product contains Potassium Sodium Tartrate and is subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right-to-Know Act of 1986 and of 40 CFR 372. This information must be included in Material Safety Data Sheets that are copied and distributed for this material.

No other hazardous material is present in concentration greater than 1%.

Comments: N.F.P.A. : Health (3), Fire (0), Reactivity (0),
Protection N/A.

SECTION III - Physical/Chemical Characteristics

Boiling Point: 220 C Begins to Decompose

Specific Gravity: N/A

Vapor Pressure (mm Hg): N/A

Melting Point: 70-80 C

Vapor Density (Air = 1): N/A

Evaporation Rate (Butyl Acetate = 1): N/A

Solubility in Water: Soluble in water

Appearance and Odor: Colorless, transparent crystals or white powder;
odorless

pH of Solution: 7-8

% Volatiles: 0

SECTION IV - Fire and Explosion Hazard Data

Flash Point (Method Used) Flammable Limits* LEL: N/A UEL: N/A

*Fire is possible at elevated temperatures or by contact with an ignition
source

Extinguishing Media:

Water spray, dry chemical, alcohol foam, or carbon dioxide

Special Fire Fighting Procedures:

wear full protective clothing and NIOSH-approved self contained breathing
apparatus with full facepiece operated in the pressure demand or other
positive pressure mode

Unusual Fire and Explosion Hazards:

REPORT NUMBER: 703

UNIVAR USA INC.

PAGE: 003

MSDS NO: P22016VS

MATERIAL SAFETY DATA SHEET

MAINFRAME UPLOAD DATE: 06/04/03

VERSION: 002

PRODUCT: ROCHELLE SALTS

ORDER NO: 236182

PROD NO : 601333

Fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard

SECTION V - Reactivity Data

Stability - Unstable: N Stable: Y under ordinary conditions of use and storage

Conditions to Avoid:

Heat, flames, ignition sources and incompatibles

Incompatibility (Materials to Avoid):

Acids, calcium or lead salts, silver nitrate, magnesium sulfate

Hazardous Decomposition or Byproducts:

Carbon dioxide and carbon monoxide may form when heated to decomposition

Hazardous Polymerization - May Occur: N Will not Occur: Y

SECTION VI - Health Hazard Data

Emergency Overview:

Caution! May cause irritation to skin, eyes, and respiratory tract

Route(s) of Entry: Inhalation: Yes Skin: Yes Ingestion: Yes

Health Hazards (Acute and Chronic):

Inhalation: May cause irritation to respiratory tract. Symptoms may include coughing and shortness of breath

Ingestion: Large oral doses may cause irritation to the gastrointestinal tract. May cause sore throat, abdominal pain. Large doses can have cathartic effects

Skin Contact: May cause irritation with redness and pain

Eye Contact: May cause irritation, redness and pain

Carcinogenicity

N/A No

NTP

No

IARC Monographs

None

OSHA Regulated

REPORT NUMBER: 703

UNIVAR USA INC.

PAGE: 003

MSDS NO: P22016V9

MATERIAL SAFETY DATA SHEET

MAINFRAME UPLOAD DATE: 06/04/03

VERSION: 002

PRODUCT: ROCHELLE SALTS

ORDER NO: 236182

PROD NO : 601333

Fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard

SECTION V - Reactivity Data

Stability - Unstable: N Stable: Y under ordinary conditions of use and storage

Conditions to Avoid:

Heat, flames, ignition sources and incompatibles

Incompatibility (Materials to Avoid):

Acids, calcium or lead salts, silver nitrate, magnesium sulfate

Hazardous Decomposition or Byproducts:

Carbon dioxide and carbon monoxide may form when heated to decomposition

Hazardous Polymerization - May Occur: N Will not Occur: Y

SECTION VI - Health Hazard Data

Emergency Overview:

Caution! May cause irritation to skin, eyes, and respiratory tract

Route(s) of Entry: Inhalation: Yes Skin: Yes Ingestion: Yes

Health Hazards (Acute and Chronic):

Inhalation: May cause irritation to respiratory tract. Symptoms may include coughing and shortness of breath

Ingestion: Large oral doses may cause irritation to the gastrointestinal tract. May cause sore throat, abdominal pain. Large doses can have cathartic effects

Skin Contact: May cause irritation with redness and pain

Eye Contact: May cause irritation, redness and pain

Carcinogenicity

N/A No

NTP

No

IARC Monographs

None

OSHA Regulated

PRODUCT: ROCHELLE SALTS

ORDER NO: 236182

PROD NO : 601333

Work/Hygienic Practices:

Use good hygiene. Always wash hands and skin thoroughly after handling. Do not eat, drink or smoke in work area. Use with proper ventilation and temperature control. Remove contaminated clothing immediately.

SECTION IX - Control Measures

Respiratory Protection (Specify Type):

For conditions of use where exposure to dust or mist is apparent and engineering controls are not feasible, a particular respirators (NIOSH type N95 or better filters) may be worn. If oil particles (e.g. lubricants, cutting fluids, glycerine, etc.) are present use NIOSH type R or P filter. For emergencies or instances where the exposure levels are not known, use a full-face positive-pressure, air supplied respirator. WARNING: Air-purifying-respirators do not protect workers in oxygen-deficient atmospheres.

Ventilation: In general, dilution ventilation is a satisfactory health hazard control for this substance. However, if conditions of use create discomfort to the worker, a local exhaust system should be considered

Other:

Protective Gloves: Wear protective gloves

Eye Protection: Use chemical safety goggles. Maintain eye wash fountain and quick-drench facilities in work area

Other Protective Clothing or Equipment:

Wear clean body covering clothing

SECTION X - Transportation

Not regulated

SECTION XI - Additional Warning and Information

REPORT NUMBER: 703

UNIVAR USA INC.

PAGE: 006

MSDS NO: P22016VS

MATERIAL SAFETY DATA SHEET

MAINFRAME UPLOAD DATE: 06/04/03

VERSION: 002

PRODUCT: ROCHELLE SALTS

ORDER NO: 236182

PROD NO : 601333

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

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

10/24/05 13:52 PRODUCT: 601333 CUST NO: 113365 ORDER NO: 236182

----- NOTICE -----

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

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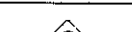
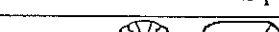
DO NOT USE INGREDIENT INFORMATION AND/OR PERCENTAGES IN THIS MSDS AS A
PRODUCT SPECIFICATION. FOR PRODUCT SPECIFICATION INFORMATION REFER TO A PRODUCT
SPECIFICATION SHEET AND/OR A CERTIFICATE OF ANALYSIS. THESE CAN BE OBTAINED FROM
YOUR LOCAL UNIVAR SALES OFFICE.

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RELATE TO ITS USE IN COMBINATION WITH ANY OTHER MATERIAL OR IN ANY OTHER
PROCESS.

*** END OF MSDS ***



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>(0)</td></tr><tr><td>Reactivity</td><td>(0)</td></tr></table>	Health Hazard	(2)	Fire Hazard	(0)	Reactivity	(0)	 See Section 15.
Health Hazard	(2)							
Fire Hazard	(0)							
Reactivity	(0)							

Section 1. Chemical Product and Company Identification

Common Name/ Trade Name	Sodium borate <i>Borax</i>	Code	S3721
Manufacturer	SPECTRUM CHEMICAL MFG. CORP. 14422 SOUTH SAN PEDRO STREET GARDENA, CALIFORNIA 90248-9985	CAS#	1303-96-4
Commercial Name(s)	Not available	RTECS	SC7310000
Synonym	Sodium pyroborate <i>Borax</i>	TSCA	On the TSCA list.
Chemical Name	Sodium tetraborate decahydrate	CI#	Not available.
Chemical Family	Not available.	In case of emergency	
Chemical Formula	Na ₂ B ₄ O ₇ ·10(H ₂ O)	CHEMTREC (24hr) 800-424-9300	
Supplier	SPECTRUM QUALITY PRODUCTS 14422 S. SAN PEDRO STREET GARDENA, CA 90248-9985	Emergency phone: (310) 516-8000	

Section 2. Composition and Information on Ingredients

Name	CAS#	TWA (mg/m ³)	STEL (mg/m ³)	CEIL (mg/m ³)	% by Weight
Sodium borate	1303-96-4				100
Toxicological Data on Ingredients	Sodium borate:				

Section 3. Hazards Identification

Potential Acute Health Effects Slightly dangerous to dangerous in case of skin contact (irritant), of eye contact (irritant). Very slightly to slightly dangerous in case of skin contact (permeator), of ingestion, of inhalation. This product may irritate eyes and skin upon contact.

Potential Chronic CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. Toxicity of the product to the reproductive system: Not available. There

**Health
Effects**

is no known effect from chronic exposure to this product. Repeated or prolonged exposure is not known to aggravate medical condition.

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: Neutralize exposed skin with a dilute solution of boric acid or acetic acid. 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.

**Hazardous
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.

**Hazardous
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.

**Hazardous
Ingestion**

No additional information.

Section 5. Fire and Explosion Data

Flammability of the Product

Non-flammable.

Auto-Ignition Temperature

Not applicable.

Flash Points

Not applicable.

Flammable Limits

Not applicable.

Not applicable.

Fire Hazards in Presence of Various Substances	Not applicable.
Explosion 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	Non-flammable.
Special Remarks on Fire Hazards	Non combustible.
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. If necessary: Neutralize the residue with a dilute solution of acetic acid. 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. Neutralize the residue with a dilute solution of acetic acid. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system.

Section 7. Handling and Storage

Precautions	DO NOT breathe dust. If you feel unwell, seek medical attention and show the label when possible. Avoid contact with skin and eyes. Keep away from incompatibles as oxidizing agents.
Storage	No specific storage is required. Use shelves or cabinets sturdy enough to bear the weight of the chemicals. Be sure that it is not necessary to strain to reach materials, and that shelves are not overloaded.

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. Gloves (impervious).
Personal	Splash goggles. Full suit. Boots. Gloves. Suggested protective clothing might not be sufficient;

Protection in
Case of a
Large Spill

Exposure
Limits

TWA: 0.31 (ppm) TWA: 5 (mg/m) from ACGIH [1995] Consult local authorities for acceptable exposure limits.

Section 9. Physical and Chemical Properties

Physical state and appearance	Solid. (Solid crystalline	Odor	Odorless.
Molecular Weight	381.37	Taste	Not available.
pH (1% soln/water)	10	Color	White.
Boiling Point	Decomposes.		
Melting Point	75.C (167.F)		
Critical Temperature	Not available.		
Specific Gravity	1.73 (Water = 1)		
Vapor Pressure	Not available.		
Vapor Density	Not available.		
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, hot water. Insoluble in methanol.		

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	Slightly reactive to reactive with oxidizing agents.
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.
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Other Classifications

WHMIS (Canada)

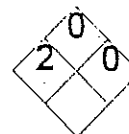
DSCL (EEC)

HMIS (U.S.A.)

Health Hazard	0
Fire Hazard	0
Reactivity	0
Personal Protection	

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

Health



Flammability

Reactivity

Specific hazard

Personal Protective Equipment



Protective Gloves (impervious).



Lab coat.



Splash goggles.

Section 16. Other Information

References -Hawley, G.G.. The Condensed Chemical Dictionary, 11e ed., New York N.Y., Van Nostrand Reinold, 1987.
-SAX, N.I. Dangerous Properties of Industrial Materials. Toronto, Van Nostrand Reinold, 6e ed. 1984.
-The Sigma-Aldrich Library of Chemical Safety Data, Edition II.

Catalog Number(s) S1180, S1181, S1183, S1185, S1186

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.

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). Very slightly to slightly dangerous in case of skin contact (permeator), 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	Ingestion of 5-10 grams has produced severe vomiting, diarrhea, shock and death.

Section 12. Ecological Information

Ecotoxicity	Not available.
BOD5 and COD	Not available.
Products of Biodegradation	Some metallic oxides.
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.
----------------	--

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

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:

NONE

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)

DSCL (EEC)

Section 16. Other Information

References -Hawley, G.G.. The Condensed Chemical Dictionary, 11e ed., New York N.Y., Van Nostrand Reinold, 1987.
-SAX, N.I. Dangerous Properties of Industrial Materials. Toronto, Van Nostrand Reinold, 6e ed. 1984.
-The Sigma-Aldrich Library of Chemical Safety Data, Edition II.

Catalog Number(s) S1180, S1181, S1183, S1185, S1186

Other Special Considerations No additional remark.

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

Verified by E. Brull.
Name

Emergency Phone: (310)516-8000

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COLUMBUS CHEMICAL INDUSTRIES INC.

10-1066

P.O. BOX
COLUMBUS, WISCONSIN 53925-000
(920) 623-214
FAX (920) 623-257**Material Safety Data Sheet**May be used to comply with OSHA's Hazard
Communication Standard, 29 CFR 1910.1200. Standard
must be consulted for specific requirements**U.S. Department of Labor**Occupational Safety and Health Administration
(Non-Mandatory Form)
Form Approved
OMB No. 1218-0072**IDENTITY** (as Used on Label and List)**Potassium Oxalate, monohydrate****Note:** Blank spaces are not permitted. If any item is not
applicable or no information is available, the space
must be marked to indicate that.**Section I**

Manufacturers /Distributor Address Number Street City State and Zip Code

Columbus Chemical Industries

N4335 Temkin Rd

Columbus, WI 53925-0008

Emergency Telephone Number

CHEMTREC 1-800-424-9300

Telephone Number for Information

920-623-2140

Date Prepared

08-24-2005

Signature of Preparer (optional)

Section II - Hazardous Ingredients/Identity Information

Hazardous Components

(Specific Chemical Identity, Common Name(s))

CAS #

OSHA PEL

ACGIH TLV

Other Limits

Recommended

% (optional)

Potassium Oxalate*

62-76-0

Not available

Not available

Not available

100%

*Synonyms: Ethanoic acid, dipotassium salt monohydrate; Oxalic acid, dipotassium salt monohydrate.

Section III - Physical/Chemical Characteristics

Boiling Point

Not available

Specific Gravity ($H_2O = 1$)

2.13

Vapor Pressure (mm Hg)

Not available

Melting Point

356°C (673°F)

Vapor Density (AIR = 1)

Not available

Evaporation Rate (Butyl Acetate = 1)

Not available

Solubility in Water

Soluble. 3g in 100g water.

Appearance and Odor

White crystalline powder

Section IV Fire and Explosion Hazard Data

Flash Point (Method Used)

Nonflammable

Flammable Limits

LEL

Not applicable

UEL

Not applicable

Extinguishing Media

Use extinguishing media appropriate for surrounding fire.

Special Fire Fighting Procedures

Firefighters should wear proper protective equipment and self-contained breathing apparatus with full face piece
with full facepiece operated in the pressure demand or other positive pressure mode. Prevent contact with skin and eyes.

Unusual Fire and Explosion Hazards

Material in powder form is capable of creating a dust explosion.

Section V Reactivity Data

Stability	Unstable		Conditions to Avoid	Heat, incompatibles
	Stable	X		

Incompatibility Materials to Avoid

Oxidizing agents, acids, alkalis, silver compounds, hypochlorites and chlorites. Hygroscopic.

Hazardous Decomposition or Byproducts

carbon oxides, potassium oxides

Hazardous Polymerization**Conditions to Avoid**

	May Occur		Not available
	Will Not Occur	X	

Section VI Health Hazard Data

Routes of Entry	Inhalation ?	Skin ?	Ingestion ?
Multiple	Yes	Yes	Yes

Health Hazards (Acute and Chronic)

EYES/SKIN: Corrosive. May cause corneal damage. INHALATION: Cause irritation of the mucous membranes and upper respiratory tract. INGESTION: May cause digestive tract irritation.

Carcinogenicity	NTP	IARC Monographs	OSHA REGULATED?
	Not listed	Not listed	Not listed

Signs and Symptoms of Exposure.

Conjunctivitis, corneal burns, severe skin burns / ulceration, chest pain, spitting blood, dyspnea, bronchopneumonia, cyanosis, shock, muscle spasm, convulsions, hematuria, jaundice, abdominal pain, nausea, vomiting, diarrhea
 Medical Conditions Generally Aggravated by Exposure Expected to aggravate asthma, emphysema, other respiratory diseases and existing dermatitis.

Emergency and First Aid Procedures INGESTION: Give milk, milk of magnesia or water. Call a physician immediately.

INHALATION: Remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen. SKIN: Flush with water for at least 15 minutes. Remove contaminated clothing; call a physician. EYES: Flush with large amounts of water for at least 15 minutes, lifting lower and upper eyelids.

Section VII Precautions for Safe Handling and Use

Steps to be Taken in Case Material is Released or Spilled Evacuate unprotected personnel from area. Ventilate area. Wear rubber boots, heavy protective gloves and chemical safety goggles. With clean shovel carefully place material into clean, dry container, cover and remove from area. Ventilate and wash spill area when complete.

Waste Disposal Method Dispose of spillage, empty containers, and other materials used for clean up in accordance with all Federal, state, and local regulations.

Precautions to be Taken in Handling and Storing Store in a cool, dry, well-ventilated area in tightly-closed, plainly-labelled containers. Store in a resistant container. Protect against moisture, physical damage and light. Maintain adequate ventilation. Wash thoroughly after handling. Do not ingest or breathe vapors. Protect exposed tissues. Hygroscopic, keep tightly closed.

Other Precautions Containers, even when empty, will retain residue and vapors. Always obey hazard warnings and handle empty containers as if they were full.

Section VII Control Measures

Respiratory Protection (Specify Type) NIOSH/ MSHA-approved respirator with acid vapor cartridge if necessary.

Ventilation	Local Exhaust	Required	Special	Eye wash station.
	Mechanical (General)	Recommended.	Other	Safety Shower.

Protective Gloves Appropriate chemical-resistant gloves

Eye Protection Chemical Safety Goggles

Other Protective Clothing or Equipment Rubber apron, boots. Faceshield.

Work /Hygienic Practices Do not wear contact lenses when handling this material. Wash thoroughly after handling. Avoid eye and skin contact. Avoid breathing vapors. Follow safe handling and laboratory practices. Wash hands prior to eating or smoking. CORROSIVE! Avoid prolonged or repeated contact.

Columbus Chemical Industries, Inc. ("Columbus") believes that the information herein is factual but it is not intended to be all inclusive. The information relates only to the specific Material designated and does not relate to its use in combination with other materials or its use as to any particular process. Because safety standards and regulations are subject to change and because Columbus has no continuing control over the Material, those handling, storing or using the Material should satisfy themselves that they have current information regarding the particular way the Material is handled, stored and used and that the same is done in accordance with federal, state and local law. COLUMBUS MAKES NO WARRANTY, EXPRESS OR IMPLIED, INCLUDING (WITHOUT LIMITATION) WARRANTIES WITH RESPECT TO THE COMPLETENESS OR CONTINUING ACCURACY OF THE INFORMATION CONTAINED HEREIN OR WITH RESPECT TO FITNESS FOR ANY PARTICULAR USE.

REPORT NUMBER: 703

UNIVAR USA INC.

PAGE: 001

MSDS NO: MZS5230

MATERIAL SAFETY DATA SHEET

MAINFRAME UPLOAD DATE: 03/30/05

VERSION: 004

PRODUCT: SODIUM THIOSULFATE

ORDER NO: 231068

PROD NO : 503233

PHOTOGRAPHERS FORMULARY
CALL IN ADVANCE TO MEET
7079 HWY 83 N.
BOX 89
CONDON , MT 59824

UNIVAR USA INC.

(425)889-3400

6100 CARILLON POINT , KIRKLAND

, WA 98033

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

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

PRODUCT NAME: SODIUM THIOSULFATE

MSDS NUMBER: MZS5230

DATE ISSUED: 3/21/2005

SUPERSEDES: 5/22/2002

ISSUED BY: 008614

=====

SODIUM THIOSULFATE

=====

1. PRODUCT IDENTIFICATION

SYNONYMS: SODIUM THIOSULFATE, PENTAHYDRATE; THIOSULFURIC ACID,
DISODIUM SALT, PENTAHYDRATE

CAS NO: 7772-98-7 (ANHYDROUS) 10102-17-7 (PENTAHYDRATE)

MOLECULAR WEIGHT: 248.17

CHEMICAL FORMULA: $\text{Na}_2\text{S}_2\text{O}_3 \cdot 5\text{H}_2\text{O}$

Distributed by:

Univar USA Inc.

6100 Carillon Point

Kirkland, WA 98033

REPORT NUMBER: 703

UNIVAR USA INC.

PAGE: 002

MSDS NO: MZS5230

MATERIAL SAFETY DATA SHEET

MAINFRAME UPLOAD DATE: 03/30/05

VERSION: 004

PRODUCT: SODIUM THIOSULFATE

ORDER NO: 231068

PROD NO : 503233

425-889-3400

2. COMPOSITION/INFORMATION ON INGREDIENTS

INGREDIENT	CAS NO	PERCENT	HAZARDOUS
SODIUM THIOSULFATE	7772-98-7	100%	YES

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

CAUTION! MAY BE HARMFUL IF SWALLOWED OR INHALED. MAY CAUSE IRRITATION TO SKIN, EYES, AND RESPIRATORY TRACT.

POTENTIAL HEALTH EFFECTS

INHALATION:

MAY CAUSE IRRITATION TO THE RESPIRATORY TRACT. SYMPTOMS MAY INCLUDE COUGHING AND SHORTNESS OF BREATH.

INGESTION:

LOW LEVEL OF TOXICITY BY INGESTION. DIARRHEA MAY OCCUR BY INGESTION OF LARGE QUANTITIES.

SKIN CONTACT:

IRRITATION MAY OCCUR FROM PROLONGED SKIN CONTACT.

EYE CONTACT:

CONTACT MAY CAUSE MECHANICAL IRRITATION.

CHRONIC EXPOSURE:

CHRONIC EXPOSURE MAY CAUSE SKIN EFFECTS.

AGGRAVATION OF PRE-EXISTING CONDITIONS:

NO INFORMATION FOUND.

4. FIRST AID MEASURES

INHALATION:

REMOVE TO FRESH AIR. GET MEDICAL ATTENTION FOR ANY BREATHING DIFFICULTY.

REPORT NUMBER: 703

UNIVAR USA INC.

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MSDS NO: MZS5230

MATERIAL SAFETY DATA SHEET

MAINFRAME UPLOAD DATE: 03/30/05

VERSION: 004

PRODUCT: SODIUM THIOSULFATE

ORDER NO: 231068

PROD NO : 503233

=====

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

AIRBORNE EXPOSURE LIMITS:

NONE ESTABLISHED.

VENTILATION SYSTEM:

IN GENERAL, DILUTION VENTILATION IS A SATISFACTORY HEALTH HAZARD CONTROL FOR THIS SUBSTANCE. HOWEVER, IF CONDITIONS OF USE CREATE DISCOMFORT TO THE WORKER, A LOCAL EXHAUST SYSTEM SHOULD BE CONSIDERED.

PERSONAL RESPIRATORS (NIOSH APPROVED):

FOR CONDITIONS OF USE WHERE EXPOSURE TO DUST OR MIST IS APPARENT AND ENGINEERING CONTROLS ARE NOT FEASIBLE, A PARTICULATE RESPIRATOR (NIOSH TYPE N95 OR BETTER FILTERS) MAY BE WORN. 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-FACE 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:

SAFETY GLASSES. MAINTAIN EYE WASH FOUNTAIN AND QUICK-DRENCH FACILITIES IN WORK AREA.

=====

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:

MONOCLINIC, COLORLESS CRYSTALS.

BOILING POINT:

> 100C (> 212F)

ODOR:

ODORLESS.

MELTING POINT:

48C (118F) LOSES WATER @ 100C (212F)

SOLUBILITY:

79G/100 ML WATER @ 4C (39F)

VAPOR DENSITY (AIR=1):

NO INFORMATION FOUND.

DENSITY:

1.75

VAPOR PRESSURE (MM HG):

NO INFORMATION FOUND.

PH:

NO INFORMATION FOUND.

EVAPORATION RATE (BUAC=1):

NO INFORMATION FOUND.

REPORT NUMBER: 703

UNIVAR USA INC.

PAGE: 005

MSDS NO: MZS5230

MATERIAL SAFETY DATA SHEET

MAINFRAME UPLOAD DATE: 03/30/05

VERSION: 004

PRODUCT: SODIUM THIOSULFATE

ORDER NO: 231068

PROD NO : 503233

% VOLATILES BY VOLUME @ 21C (70F):

0
=====

10. STABILITY AND REACTIVITY

STABILITY:

STABLE UNDER ORDINARY CONDITIONS OF USE AND STORAGE. STABILITY LIMITED IN SOLUTION.

HAZARDOUS DECOMPOSITION PRODUCTS:

OXIDES OF SULFUR AND HYDROGEN SULFIDE.

HAZARDOUS POLYMERIZATION:

WILL NOT OCCUR.

INCOMPATIBILITIES:

SODIUM NITRATE, HALOGENS, AND OXIDIZING AGENTS. REACTS WITH ACIDS TO RELEASE SULFUR DIOXIDE.

CONDITIONS TO AVOID:

INCOMPATIBLES.
=====

11. TOXICOLOGICAL INFORMATION

NO LD50/LC50 INFORMATION FOUND RELATING TO NORMAL ROUTES OF OCCUPATIONAL EXPOSURE.

-----\CANCER LISTS\-----

INGREDIENT	---NTP CARCINOGEN---		IARC CATEGORY
	KNOWN	ANTICIPATED	
SODIUM THIOSULFATE (7772-98-7)	NO	NO	NONE

=====

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL FATE:

NO INFORMATION FOUND.

ENVIRONMENTAL TOXICITY:

NO INFORMATION FOUND.

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PROD NO : 503233

13. DISPOSAL CONSIDERATIONS

WHATEVER CANNOT BE SAVED FOR RECOVERY OR RECYCLING SHOULD BE MANAGED IN AN 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.

14. TRANSPORT INFORMATION

NOT REGULATED.

15. REGULATORY INFORMATION

-----\CHEMICAL INVENTORY STATUS - PART 1\-----				
INGREDIENT	TSCA	EC	JAPAN	AUSTRALIA
SODIUM THIOSULFATE (7772-98-7)	YES	YES	YES	YES

-----\CHEMICAL INVENTORY STATUS - PART 2\-----				
INGREDIENT	KOREA	--CANADA--		
		DSL	NDL	PHIL.
SODIUM THIOSULFATE (7772-98-7)	YES	YES	NO	YES

-----\FEDERAL, STATE & INTERNATIONAL REGULATIONS - PART 1\-----				
INGREDIENT	-SARA 302-		-SARA 313-	
	RQ	TPQ	LIST	CHEMICAL CATG
SODIUM THIOSULFATE (7772-98-7)	NO	NO	NO	NO

-----\FEDERAL, STATE & INTERNATIONAL REGULATIONS - PART 2\-----			
INGREDIENT	CERCLA	-RCRA-	-TSCA-
		261.33	8(D)
SODIUM THIOSULFATE (7772-98-7)	NO	NO	NO

CHEMICAL WEAPONS CONVENTION: NO TSCA 12(B): NO COTA: NO

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ORDER NO: 231068

PROD NO : 503233

SARA 311/312: ACUTE: YES CHRONIC: NO FIRE: NO PRESSURE: NO
REACTIVITY: NO (PURE / SOLID)

AUSTRALIAN HAZCHEM CODE: NONE ALLOCATED.
POISON SCHEDULE: NONE ALLOCATED.

WHMIS: 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.

=====

16. OTHER INFORMATION

NFPA RATINGS:

HEALTH: 1 FLAMMABILITY: 0 REACTIVITY: 0

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VERSION: 004

PRDD NO : 503233

04/25/05 15:42 PRODUCT: 503233 CUST NO: 113365 ORDER NO: 231068

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PARTICULAR PURPOSE, WITH RESPECT TO THE PRODUCT OR INFORMATION PROVIDED

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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 YOUR LOCAL UNIVAR SALES OFFICE.


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



Gardena, CA

Material Safety Data Sheet

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

Section 1. Chemical Product and Company Identification

Common Name/ Trade Name	Ammonium hydroxide	Code	A5110
Manufacturer	SPECTRUM CHEMICAL MFG. CORP. 14422 SOUTH SAN PEDRO STREET GARDENA, CALIFORNIA 90248-9985	CAS#	1336-21-6
Commercial Name(s)	Not available	RTECS	BQ9625000
Synonym	Not available.	TSCA	On the TSCA list.
Chemical Name	Not available.	CI#	Not available.
Chemical Family	Not available.	<u>In case of emergency</u> CHEMTREC (24hr) 800-424-9300 Emergency phone: (310) 516-8000	
Chemical Formula	NH4OH		
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
Ammonium hydroxide	1336-21-6				100

Toxicological Data on Ingredients
 Ammonium hydroxide:
 ORAL (LD50): Acute: 350 mg/kg (Rat).

Section 3. Hazards Identification

Potential Acute Health Effects
 Extremely dangerous in case of eye contact (irritant). Very dangerous in case of skin contact (irritant), of ingestion, of inhalation. Slightly dangerous to dangerous in case of skin contact (corrosive). Very slightly to slightly dangerous in case of skin contact (permeator). Corrosive to eyes and skin. Corrosive to skin and eyes on contact. Liquid or spray mist may produce tissue damage particularly on mucous membranes of eyes, mouth and respiratory tract. Skin contact may produce burns. Inhalation of the spray mist may produce severe irritation of respiratory tract, characterized by coughing, choking, or shortness of breath. 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
 CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. The substance is toxic to lungs, mucous membranes. Toxicity of the

Health Effects	product to the reproductive system: Not available. Repeated or prolonged exposure to the substance can produce target organs damage. Repeated or prolonged contact with spray mist may produce chronic eye irritation and severe skin irritation. Repeated or prolonged exposure to spray mist may produce respiratory tract irritation leading to frequent attacks of bronchial infection. Repeated exposure to an highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.
-----------------------	---

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: Neutralize exposed skin with a dilute solution of boric acid or acetic acid. 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. 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	DO NOT induce vomiting. Have conscious person drink several glasses of water or milk. Seek immediate medical attention.
Hazardous Ingestion	DO NOT induce vomiting. 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. Loosen tight clothing such as a collar, tie, belt or waistband. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek immediate medical attention.

Section 5. Fire and Explosion Data

Flammability of the Product	Non-flammable.
Auto-Ignition Temperature	Not applicable.
Flash Points	Not applicable.
Flammable Limits	Not applicable.

Products of Combustion	Not applicable.
Fire Hazards in Presence of Various Substances	Not applicable.
Explosion 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	Non-flammable.
Special Remarks on Fire Hazards	No additional remark.
Special Remarks on Explosion Hazards	No additional remark.

Section 6. Accidental Release Measures

Small Spill	Dilute with water and mop up, or absorb with an inert DRY material and place in an appropriate waste disposal container. If necessary: Neutralize the residue with a dilute solution of acetic acid.
Large Spill	Corrosive liquid. Poisonous liquid. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. DO NOT get water inside container. DO NOT touch spilled material. Use water spray curtain to divert vapor drift. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. Neutralize the residue with a dilute solution of acetic acid.

Section 7. Handling and Storage

Precautions	Keep locked up. Keep container dry. DO NOT ingest. Do not breathe gas, fumes, vapor or spray. Never add water to this product. 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.
Storage	Corrosive materials should be stored in a separate safety storage cabinet or room.

Section 8. Exposure Controls/Personal Protection

Engineering Controls	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash station and safety shower is proximal to the work-station location.
Personal Protection	Splash goggles. Full suit. Vapor respirator. Be sure to use a MSHA/NIOSH approved respirator or equivalent. Gloves (impervious). Boots. Wear appropriate respirator when ventilation is inadequate.
	Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus

**Personal
Protection in
Case of a
Large Spill**

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	Liquid.	Odor	Not available.
Molecular Weight	Not available.	Taste	Not available.
pH (1% soln/water)	12	Color	Not available.
Boiling Point	Not available.		
Melting Point	Decomposes.		
Critical Temperature	Not available.		
Specific Gravity	0.898 (Water = 1)		
Vapor Pressure	475 mm of Hg (@ 20.C)		
Vapor Density	Not available.		
Volatility	Not available.		
Odor Threshold	5 ppm		
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	Easily 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, Inhalation.
-----------------	------------------------

Toxicity to Animals

Acute oral toxicity (LD50): 350 mg/kg (Rat).

**Chronic Effects
on Humans**

The substance is toxic to lungs, mucous membranes. Toxicity of the product to the reproductive system: Not available.

**Other Toxic
Effects on Humans**

Extremely dangerous in case of eye contact (irritant). Very dangerous in case of skin contact (irritant), of ingestion, of inhalation. Slightly dangerous to dangerous in case of skin contact (corrosive). Very slightly to slightly dangerous in case of skin contact (permeator).

**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**

Not applicable.

**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.

Section 14. Transport Information**DOT Classification**

DOT CLASS 8: Corrosive liquid.

Identification

Ammonia Solution UN2672 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:

NONE

Pennsylvania 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:

Ammonium hydroxide

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:

Ammonium hydroxide

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:

Ammonium hydroxide

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 E: Corrosive liquid.

DSCL (EEC)

R22- Harmful if ingested.
R35- Causes severe burns.
R39- Danger of very serious irreversible effects.

Other Classifications

WHMIS (Canada)

WHMIS CLASS D-1B: Material causing immediate and serious toxic effects (TOXIC).
WHMIS CLASS E: Corrosive liquid.

DSCL (EEC)

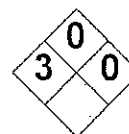
R22- Harmful if ingested.
R35- Causes severe burns.
R39- Danger of very serious irreversible effects.
R41- Risk of serious damage to eyes.
R42- May cause sensitization by inhalation.
R26/27/28- Very toxic by inhalation, in contact with skin and if swallowed.

HMIS (U.S.A.)

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

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

Health



Flammability

Reactivity

Specific hazard

Personal Protective Equipment

Protective Gloves (impervious).

Full suit.

Vapor 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) A1187, A1195, A1197, A1198, A1200, A1293, AM180

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.



10-1000
COLUMBUS CHEMICAL INDUSTRIES INC.

P.O. BOX 8
COLUMBUS, WISCONSIN 53925-0008
(920) 623-2140
FAX (920) 623-2577

Material Safety Data Sheet

May be used to comply with OSHA's Hazard Communication Standard, 29 CFR 1910.1200. Standard must be consulted for specific requirements

U.S. Department of Labor

Occupational Safety and Health Administration
(Non-Mandatory Form)
Form Approved
OMB No. 1218-0072

IDENTITY (as Used on Label and List)

Potassium Dichromate

Note: Blank spaces are not permitted. If any item is not applicable or no information is available, the space must be marked to indicate that.

Section I

Manufacturers /Distributor Address Number Street City State and Zip Code

Columbus Chemical Industries, Inc.

N4335 Temkin Road

Columbus, Wisconsin 53925

Emergency Telephone Number

CHEMTREC: 1 (800) 424-9300

Telephone Number for Information

1 (920) 623-2140

Date Prepared

04-26-2005

Signature of Preparer (optional)

Section II - Hazardous Ingredients/Identity Information

Hazardous Components (Specific Chemical Identity, Common Name(s))	CAS #	OSHA PEL	ACGIH TLV	Other Limits Recommended	% (optional)
Potassium Dichromate* **	7778-50-9	0.1 mg/m ³	0.05 mg/m ³	0.001 mg/m ³	
		as CrO ₃	as Cr	REL 10hr	

*Subject to SARA Section 313 Reporting Requirements.

** Synonyms: Potassium Bichromate, Bichromate of Potash

Section III - Physical/Chemical Characteristics

Boiling Point	500°C(932°F)	Specific Gravity (H ₂ O = 1)	Not available
Vapor Pressure (mm Hg)	Not available	Melting Point	398°C(748°F)
Vapor Density (AIR = 1)	Not available	Evaporation Rate (Butyl Acetate = 1)	Not available

Solubility in Water

Soluble, 10.5% w/w @ 20°C

Appearance and Odor

Orange-red, odorless solid

Section IV Fire and Explosion Hazard Data

Flash Point (Method Used)	Flammable Limits	LEL	UEL
Nonflammable		Not applicable	Not applicable

Extinguishing Media

Suitable to extinguish the supporting flame. Water spray, dry chemical, carbon dioxide, alcohol foam.

Special Fire Fighting Procedures

In the event of a fire, wear full protective clothing and NIOSH/MSHA approved self-contained breathing apparatus

with full facepiece operated in the pressure demand or other positive pressure mode. Prevent contact with skin and eyes.

Unusual Fire and Explosion Hazards

May emit toxic fumes under fire conditions. Oxidizer. Reacts explosively with Hydrazine and anhydrous Hydroxylamine

Section V Reactivity Data

Stability	Unstable		Conditions to Avoid	Incompatibles.
	Stable	X		

Incompatibility Materials to Avoid

Reducing agents, combustible materials, organic materials, acids, metals and alkalis.

Hazardous Decomposition or Byproducts

Potassium, potassium oxide.

Hazardous Polymerization**Conditions to Avoid**

	May Occur		None
	Will Not Occur	X	

Section VI Health Hazard Data

Routes of Entry	Inhalation ?	Skin ?	Ingestion ?
	Yes	Yes	Yes

Health Hazards (Acute and Chronic)

Skin: Corrosive, permeator, sensitizer. Eyes: severe corrosive, may cause permanent corneal damage. Inhalation:

corrosive, prolonged inhalation may cause asthma. May result in impaired kidney and liver function. Ingestion:

Causes severe irritation, This material is a known carcinogen.

Carcinogenicity	NTP	IARC Monographs	OSHA REGULATED?
	Known	Known Group 1	Chromium

Signs and Symptoms of Exposure.

Burning sensation, coughing, wheezing, laryngitis, shortness of breath, headache, nausea, vomiting, erythema, blisters, tissue destruction, bloody diarrhea, edema, convulsions, bronchitis, pneumonia, cardiovascular collapse, shock and death.

Medical Conditions Generally Aggravated by Exposure

Asthma, emphysema, other respiratory diseases.

Emergency and First Aid Procedures EYES/SKIN: Flush immediately with plenty of water for at least 15 minutes. Remove

contaminated clothing. Remove contact lenses if possible. Call physician if irritation develops. Wash clothing

before reuse. **INGESTION: DO NOT** induce vomiting. Give several cups of water to conscious victim. Call a physician.

INHALATION: Move to fresh air. Give oxygen if breathing is difficult, artificial respiration if not breathing.

Section VII Precautions for Safe Handling and Use**Steps to be Taken in Case Material is Released or Spilled**

Evacuate unprotected personnel from area. Ventilate spill area. Wear self-contained breathing apparatus, rubber boots, heavy protective gloves and chemical safety goggles. Dampen spilled material to avoid creating dust. Sweep up and place in non combustible container. Flush spill area with water.

Waste Disposal Method Dispose in accordance with all applicable Federal, state and local regulations.

Precautions to be Taken in Handling and Storing

Keep container tightly closed. Store in corrosion-proof area. Do not get in eyes or on skin or clothing. Do not taste or swallow. Avoid breathing dust. Use only with adequate ventilation. Wash thoroughly after handling. Separate from combustible materials.

Other Precautions Do not get in eyes, on clothing. Do not breathe vapor. Use with adequate ventilation. Containers, even when empty, will retain residue. Always obey hazard warnings and handle empty containers as if they were full.

Section VII Control Measures

Respiratory Protection (Specify Type) NIOSH/MSHA approved dust/mist respirator.

Ventilation	Local Exhaust	Recommended to control dust.	Special	Eye-wash station nearby.
	Mechanical (General)	Recommended.	other	Safety shower nearby.

Protective Gloves Rubber gloves. **Eye Protection** Safety goggles

Other Protective Clothing or Equipment Lab coat or apron and rubber boots. Face-shield recommended.

Work /Hygienic Practices Wash exposed areas thoroughly after handling. Wash contaminated clothing before reuse.

Do NOT wear contact lenses. Wear appropriate personal protective equipment. Oxidizer! Avoid contact with eyes, skin and clothing. Avoid prolonged or repeated exposure. **CARCINOGEN!!**

Columbus Chemical Industries, Inc. ("Columbus") believes that the information herein is factual but it is not intended to be all inclusive. The information relates only to the specific Material designated and does not relate to its use in combination with other materials or its use as to any particular process. Because safety standards and regulations are subject to change and because Columbus has no continuing control over the Material, those handling, storing or using the Material should satisfy themselves that they have current information regarding the particular way the Material is handled, stored and used and that the same is done in accordance with federal, state and local law. COLUMBUS MAKES NO WARRANTY, EXPRESS OR IMPLIED, INCLUDING (WITHOUT LIMITATION) WARRANTIES WITH RESPECT TO THE COMPLETENESS OR CONTINUING ACCURACY OF THE INFORMATION CONTAINED HEREIN OR WITH RESPECT TO FITNESS FOR ANY PARTICULAR USE.