

FORMULARY REDUCER III FOR NEGATIVES

1-liter kit

Reducer III is similar to Gevaert GR-3 and is a proportional reducer that removes silver density from a negative in approximately the same amounts as it exists in the negative. The final result of the reduction is as if the film had less original development. In this respect, the action of Reducer III can be thought of as film development in reverse.

To make the working solution, the chemicals in this kit are first used to prepare two stock solutions, which are then combined. One of the stock solutions (Solution A) contains potassium permanganate and other solution (Solution B) contains ammonium persulfate. Potassium permanganate is a proportional reducer (removes silver in proportion to its density) and the ammonium persulfate is a superproportional reducer (removes more silver from the dense areas than from the faint areas). Therefore, the relative volumes of the two solutions, A and B, that you combine to obtain a specific working solution depend upon the negative to be reduced. Typically, either equal parts of Stock Solutions A and B or one part of Stock Solution A to three parts of Stock Solution B are used. The choice must be based upon experience.

Using a reducer correctly is an art and requires experience. We strongly urge you to practice with this reducer using scrap negatives before attempting reduction of a negative of value.

CHEMICALS CONTAINED IN THIS KIT

Your kit contains the following chemicals:

<u>Chemical</u>	<u>Amount</u>
potassium permanganate	0.25 g
sulfuric acid, 48%	3 ml
ammonium persulfate	25 g
sodium metabisulfite	10 g

10-0170



Material Safety Data Sheet

NEPA	HMIS	Personal Protective Equipment						
	<table border="1"> <tr> <td>Health Hazard</td> <td style="text-align: center;">3</td> </tr> <tr> <td>Fire Hazard</td> <td style="text-align: center;">1</td> </tr> <tr> <td>Reactivity</td> <td style="text-align: center;">0</td> </tr> </table>	Health Hazard	3	Fire Hazard	1	Reactivity	0	<p>See Section 15.</p>
Health Hazard	3							
Fire Hazard	1							
Reactivity	0							

Section 1. Chemical Product and Company Identification

Common Name/ Trade Name	Ammonium persulfate	Code	A5220
		CAS#	7727-54-0
Manufacturer	SPECTRUM CHEMICAL MFG. CORP. 14422 SOUTH SAN PEDRO STREET GARDENA, CALIFORNIA 90248-9985	RTECS	SE0350000
		TSCA	On the TSCA list.
Commercial Name(s)	Not available	CI#	Not available.
Synonym	Ammonium peroxydisulfate	In case of emergency	
Chemical Name	Not available.	CHEMTREC (24hr) 800-424-9300	
Chemical Family	Not available.	Emergency phone: (310) 516-8000	
Chemical Formula	(NH ₄) ₂ S ₂ O ₈		
Supplier	SPECTRUM QUALITY PRODUCTS 14422 S. SAN PEDRO STREET GARDENA, CA 90248-9985		

Section 2. Composition and Information on Ingredients

Name	CAS#	Exposure Limits			
		TWA (mg/m ³)	STEL (mg/m ³)	CEIL (mg/m ³)	% by Weight
Ammonium persulfate	7727-54-0				100
Toxicological Data on Ingredients	Ammonium persulfate: ORAL (LD50): Acute: 820 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. This product is a severe eye irritant. Prolonged exposure may result in skin burns and ulcerations. Over-exposure by inhalation may cause respiratory irritation. 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.

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 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 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 medical attention.

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 applicable.
Fire Hazards in Presence of Various Substances	Slightly flammable to flammable in presence of reducing 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	Oxidizing material. DO NOT use water jet. Cool containing vessels with water jet in order to prevent pressure build-up, autoignition or explosion. Use flooding quantities of water. Avoid contact with organic materials.
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.
Large Spill	Oxidizing material. Stop leak if without risk. Avoid contact with a combustible material (wood, paper, oil, clothing...). Keep substance damp using water spray. DO NOT touch spilled material. 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	
Precautions	Keep away from heat. Keep away from sources of ignition. Keep away from combustible materials. 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.
Storage	Keep container dry. Keep in a cool place. Ground all equipment containing material. Oxidizing materials should be stored in a separate safety storage cabinet or room.

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). Wear appropriate respirator when ventilation is inadequate.
Personal	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 Not available.

Section 9. Physical and Chemical Properties

Physical state and appearance	Solid.	Odor	Not available.
Molecular Weight	228.2	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	1.98 (Water = 1)		
Vapor Pressure	Not available.		
Vapor Density	7.9 (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	Easily soluble in cold water. Soluble in hot 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): 820 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.

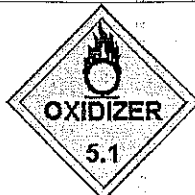
Section 14. Transport Information

DOT Classification DOT CLASS 5.1: Oxidizer.

Identification Ammonium Persulfate UN1444 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:

NONE

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)

WHMIS CLASS C: Oxidizing material.
WHMIS CLASS D-2A: Material causing other toxic effects (VERY TOXIC).

DSCL (EEC)

R8- Contact with combustible material may cause fire.
R9- Explosive when mixed with combustible material.

Other Classifications

WHMIS (Canada)

WHMIS CLASS C: Oxidizing material.
WHMIS CLASS D-2A: Material causing other toxic effects (VERY TOXIC).

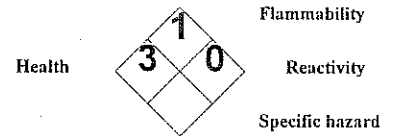
DSCL (EEC)

R8- Contact with combustible material may cause fire.
R9- Explosive when mixed with combustible material.
R22- Harmful if ingested.
R41- Risk of serious damage to eyes.
R42- May cause sensitization by inhalation.

HMIS (U.S.A.)

Health Hazard	1
Fire Hazard	1
Reactivity	0
Personal Protection	

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



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) A1225, A1227, A1230

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.

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: 004950CR
EFFECTIVE DATE: 03/22/94

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MATERIAL SAFETY DATA SHEET

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Sulfuric Acid, 77 to 100%

ORDER NO: 145148
PROD NO : 361200

PHOTOGRAPHERS FORMULARY
CALL IN ADVANCE TO MEET
HC-31
BOX 89
CONDON ,MT 59806

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

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

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

PRODUCT NAME:
Sulfuric Acid, 77 to 100%

: 004950CR

CHEMICAL PRODUCT/COMPANY IDENTIFICATION
Chemical Identification

CAS Number : 7664-93-9
Formula : H2SO4
Molecular Weight : 98.08
CAS Name : SULFURIC ACID

COMPOSITION/INFORMATION ON INGREDIENTS

Ingredients

Ingredient	CAS Number	%
Sulfuric Acid	7664-93-9	
50% TECHNICAL		77.7
50% TECHNICAL		93.2
1.835 ELECTROLYTE		93.2
3% TECHNICAL		98

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SUBJECT: Sulfuric Acid, 77 to 100%

ORDER NO: 145168
PROD NO : 361200

99% TECHNICAL 99
100% TECHNICAL 100

LOT NUMBER 7732-18-5 0-22

Regulated as a Toxic Chemical under Section 313 of Title III of the
Superfund Amendments and Reauthorization Act of 1986 and 40 CFR part

HAZARDS IDENTIFICATION

Potential Health Effects

Causes severe burns to eyes, skin, and all body tissue. Eye
damage may be permanent. Destruction of tissue may result
from direct chemical reaction with tissue, from thermal
burns, and from dehydration (removal of water) of the
tissue.

HUMAN HEALTH EFFECTS:

Human health effects of overexposure to the liquid by skin
or eye contact may cause eye corrosion with corneal or
conjunctival ulceration; or skin burns or ulceration.
Ingestion of the liquid may cause severe burns to the mucous
membranes of the mouth and esophagus. Repeated or prolonged
contact with mists may cause eye irritation with discomfort,
tearing or blurring of vision; or skin irritation with
discomfort or rash. Overexposure by inhalation may include
irritation of the upper respiratory passages or erosion of
dental surfaces. Higher inhalation exposures may lead to
temporary lung irritation effects with cough, discomfort,
difficulty breathing, or shortness of breath; or possibly
modest initial symptoms followed in hours by severe
shortness of breath, requiring prompt medical attention.

The International Agency for Research on Cancer (IARC)
classified "strong inorganic acid mists containing sulfuric
acid" as a Category 1 carcinogen, a substance that is
"carcinogenic to humans". This classification is for
inorganic acid mists only and does not apply to sulfuric
acid or sulfuric acid solutions. The basis for the IARC
classification rests on several epidemiology studies which
have several deficiencies. These studies did not account
for exposure to other substances, some known to be animal or
potential human carcinogens, social influences (smoking or
alcohol consumption) and included small numbers of subjects.
Based on the overall weight of evidence from all human and
chronic animal studies, no definitive causal relationship

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between sulfuric acid mist exposure and respiratory tract cancer has been shown.

Individuals with preexisting diseases of the lungs may have increased susceptibility to the toxicity of excessive exposures.

Carcinogenicity Information

Some of the components present in this material at concentrations of 1% or greater than 0.1% are listed by IARC, NTP, OSHA or ACGIH as carcinogens.

FIRST AID MEASURES

First Aid

INHALATION

If inhaled, immediately remove to fresh air and have patient lie down and remain quiet. Apply artificial respiration if breathing has stopped. Give oxygen if breathing is difficult. Call a physician.

INGESTION

If swallowed, do not induce vomiting. Give large quantities of water. Call a physician. Do not neutralize the acid. Never give anything by mouth to an unconscious person.

SKIN OR EYE CONTACT

In case of contact, immediately (within seconds) flush skin or eyes with plenty of water (preferably cold water) for at least 15 minutes while removing contaminated clothing and shoes. Call a physician. Wash clothing before reuse.

While the patient is being transported to a medical facility, apply compresses of iced water. If medical treatment must be delayed, immerse the affected area in iced water. If immersion is not practical, compresses of iced water can be applied. Avoid freezing tissues.

References to Physicians

Continued washing of the affected area with cold or iced water will be helpful in removing the last traces of

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PRODUCT: Sulfuric Acid, 77 to 100%

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sulfuric acid. Creams or ointments should not be applied before or during the washing phase of the treatment.

FIRE FIGHTING MEASURES

Flammable Properties

Flash Point : Will not burn

Fire and Explosion Hazards:

Reacts with most metals, especially when dilute, to give flammable, potentially explosive hydrogen gas. Follow appropriate National Fire Protection Association (NFPA) codes.

Extinguishing Media

Use media appropriate for surrounding material.

Use water spray to cool containers exposed to fire; do not get water inside containers.

Fire Fighting Instructions

Evacuate personnel to a safe area. Keep personnel removed and upwind of fire. Generates heat upon addition of water, with possible spattering. Wear full protective clothing. Runoff from fire control may cause pollution. Neutralize run-off with lime, soda ash, etc., to prevent corrosion of metals and formation of hydrogen gas. Wear self-contained breathing apparatus if fumes or mists are present.

ACCIDENTAL RELEASE MEASURES

Rescue (Personnel)

NOTE: Review FIRE FIGHTING MEASURES and HANDLING (PERSONNEL) sections before proceeding with clean-up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean-up.

Accidental Release Measures

Stop flow if possible. Review "Fire and Explosion Hazards" and "Safety Precautions" before proceeding with clean up. Use appropriate protective equipment during clean up. Soak up small spills with dry sand, clay or diatomaceous earth. Dike large spills, and cautiously dilute and neutralize with lime or soda ash, and transfer to waste water treatment system. Prevent liquid from entering sewers, waterways, or

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low areas.

If this product is spilled and not recovered, or is recovered as a waste for treatment or disposal, the reportable quantity is 1,000 lbs. (based on the sulfuric acid content of the solution spilled). Comply with Federal, State, and local regulations on reporting releases.

DuPont Emergency Exposure Limits (EEL) are established to facilitate site or plant emergency evacuation and specify airborne concentrations of brief durations which should not result in permanent adverse health effects or interfere with escape. EEL's are expressed as airborne concentration multiplied by time (C x T) for up to a maximum of 60 minutes and as a ceiling airborne concentration. These limits are used in conjunction with engineering controls/monitoring and as an aid in planning for episodic releases and spills. For more information on the applicability of EEL's, contact DuPont.

The DuPont Emergency Exposure Limit (EEL) for Sulfuric Acid is 10 mg/m³ for 15 to 60 minutes and 20 mg/m³ for up to 15 minutes with a not-to-exceed ceiling of 20 mg/m³.

IDLING AND STORAGE Handling (Personnel)

Do not get in eyes, on skin, or on clothing. Avoid breathing vapors or mist. Wash thoroughly after handling.

Keep containers closed. Do not add water to contents while in container because of violent reaction.

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Keep out of sun and away from heat, sparks, and flame. Keep container tightly closed and (drum) closure up to prevent leakage. Loosen closure carefully. Relieve internal pressure when received and at least weekly thereafter. Do not use pressure to empty. Be sure closure is securely fastened before moving container. Do not wash out container or use it for other purposes; replace closure after each withdrawal and return it with empty container.

EXPOSURE CONTROLS/PERSONAL PROTECTION Engineering Controls

Good general ventilation should be provided to keep vapor

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and mist concentrations below the exposure limits.

Personal Protective Equipment

Have available and wear as appropriate for exposure conditions when handling containers or operating equipment containing sulfuric acid: chemical splash goggles; full-length face shield/chemical splash goggles combination; acid-proof gauntlet gloves, apron, and boots; long sleeve wool, acrylic, or polyester clothing; acid proof suit and hood; and appropriate NIOSH/MSHA respiratory protection. In case of emergency or where there is a strong possibility of considerable exposure, wear a complete acid suit with hood, boots, and gloves. If acid vapor or mist are present and exposure limits may be exceeded, wear appropriate NIOSH/MSHA respiratory protection.

Exposure Guidelines

Exposure Limits

Sulfuric Acid, 77 to 100%

PEL (OSHA)	: 1 mg/m ³ , 8 Hr. TWA
TLV (ACGIH)	: 1 mg/m ³ , 8 Hr. TWA STEL 3 mg/m ³
AEL (Du Pont)	: 1 mg/m ³ , 8 & 12 Hr. TWA

AEL is Du Pont's Acceptable Exposure Limit. Where governmentally imposed occupational exposure limits which are lower than the AEL are in effect, such limits shall take precedence.

PHYSICAL AND CHEMICAL PROPERTIES

Physical Data

Boiling Point	: 193-327 C (379-621 F) @ 760 mm Hg
Vapor Pressure	: <0.3 mm Hg @ 25 C (77 F) <0.6 mm Hg @ 38 C (100 F)
Vapor Density	: 3.4
Melting Point	: -35 to 11 C (-31 to 52 F)
Evaporation Rate	: (Butyl Acetate = 1) Less than 1
Solubility in Water	: 100 WT%
pH	: Less than 1
Odor	: Odorless
Form	: Oily; clear to turbid liquid
Color	: Colorless to light gray

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GRADE	BOILING PT. DEG C	BOILING PT. DEG F	MELTING PT. DEG C	MELTING PT. DEG F	SPECIFIC GRAVITY
60 DEG TECHNICAL	193	380	-12	10	1.706
66 DEG TECHNICAL	279	535	-35	-31	1.935
1.835 ELECTROLYTE	279	535	-35	-31	1.835
98% TECHNICAL	327	621	-2	29	1.844
99% TECHNICAL	310	590	4	40	1.842
100% TECHNICAL	274	526	11	51	1.839

STABILITY AND REACTIVITY

Chemical Stability

Stable, but reacts violently with water and organic materials with evolution of heat.

Decomposition

Releases sulfur dioxide at extremely high temperatures.

Polymerization

Polymerization will not occur.

Other Hazards

Incompatibility : Vigorous reactions with water; alkaline solutions; metals, metal powder; carbides; chlorates; fulminates; nitrates; picrates; strong oxidizing, reducing, or combustible organic materials. Hazardous gases are evolved on contact with chemicals such as cyanides, sulfides, and carbides.

ECOLOGICAL INFORMATION

Ecotoxicological Data

Inhalation 1-hour LC50: 347 ppm in rats
Oral LO50 : 2,140 mg/kg in rats

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Sulfuric acid is corrosive to the skin and eyes of animals. By ingestion, it is moderately toxic in animals causing corrosion of mucosal surfaces. Toxic effects described in animals from single exposures by inhalation include respiratory irritation. Animal testing indicates that this compound does not have carcinogenic, mutagenic, embryotoxic, or reproductive effects.

ECOLOGICAL INFORMATION

Ecotoxicological Information

Aquatic Toxicity

48-hour TLm, flounder: 100-300 ppm

DISPOSAL CONSIDERATIONS

Waste Disposal

Cleaned-up material may be an RCRA Hazardous Waste on disposal due to the corrosivity characteristic. Do not flush to surface water or sanitary sewer system. Comply with Federal, State, and local regulations. If approved, neutralize and transfer to waste treatment system.

TRANSPORTATION INFORMATION

Shipping Information

DOT/IMO
Proper Shipping Name : SULFURIC ACID
Hazard Class : 8
UN No. : 1830
DOT/IMO Label : CORROSIVE
Special Information : DOT/IMO PLACARD: CORROSIVE
Packing Group : II

Reportable Quantity : 1000 lb

Shipping Containers

Tank Cars.
Tank Trucks.
Barge

If material is shipped in quantities greater than 1,000 lbs. per container, the Proper Shipping Name is RQ SULFURIC ACID.

NUMBER: 703
ID: DQ4950CR
EFFECTIVE DATE: 03/22/94

VAN WATERS & ROGERS INC.
MATERIAL SAFETY DATA SHEET

PAGE: 009
VERSION: 001

CT: Sulfuric Acid, 77 to 100X

ORDER NO: 14516B
PROD NO : 361200

REGULATORY INFORMATION

Federal Regulations

TSCA Inventory Status : Reported/Included.

TITLE III HAZARD CLASSIFICATIONS SECTIONS 311, 312

Acute : Yes
Chronic : Yes
Fire : No
Reactivity : Yes
Pressure : No

LISTS:

SARA Extremely Hazardous Substance -Yes
CERCLA Hazardous Material -Yes
SARA Toxic Chemicals -Yes

OTHER INFORMATION

A, NPCA-HMIS

NFPA Rating

Health : 3
Flammability : 0
Reactivity : 2

Water Reactive.

NPCA-HMIS Rating

Health : 3
Flammability : 0
Reactivity : 2

Personal Protection rating to be supplied by user depending on use conditions.

Additional Information

For further information, see DuPont Sulfuric Acid "Storage and Handling Bulletin".

† Indicates updated section.

End of MSDS

PORT NUMBER: 703
S NO: DQ4950CR
EFFECTIVE DATE: 03/22/94

VAN WATERS & ROGERS INC.
MATERIAL SAFETY DATA SHEET

PAGE: 010
VERSION: 001

PRODUCT: Sulfuric Acid, 77 to 100%

ORDER NO: 145168
PROD NO : 361200

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

CONTACT: MSDS COORDINATOR VAN WATERS & ROGERS INC.
DURING BUSINESS HOURS, PACIFIC TIME (206)889-3400

04/21/95 14:30 PRODUCT: 361200 CUST NO: 113365 ORDER NO: 145168

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PROCESS.

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

10-1200
10-1195

Rec'd 3-18-94

REPORT NUMBER: 971
MSDS NO: GZ003067
EFFECTIVE DATE: 11/23/92

VAN WATERS & ROGERS INC.
MATERIAL SAFETY DATA SHEET

PAGE: 001

VERSION: 001

PRODUCT: SODIUM METABISULFITE
and Sodium Bisulfite

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 - CHEMTEC
(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

PRODUCT NAME:
SODIUM METABISULFITE

MSDS #: GZ003067

----- A. GENERAL INFORMATION -----

TRADE NAME (COMMON NAME): SODIUM METABISULFITE (anhydrous sodium bisulfite,
ABS, sodium pyrosulfite)
C.A.S. No. 7681-57-4
CHEMICAL NAME AND/OR SYNONYM: Sodium Metabisulfite
FORMULA: $\text{Na}_2\text{S}_2\text{O}_5$
MOLECULAR WEIGHT: 190.11

CURRENT ISSUE DATE: May, 1988

B. FIRST AID MEASURES

INHALATION: Remove to fresh air. Get medical assistance for irritation
or any other symptoms.

INGESTION: If conscious, give plenty of water or milk. Induce vomiting by
touching finger to back of throat. Get immediate medical
attention.

SKIN: Promptly wash with plenty of soap and water.

EYES: Immediately flush eyes with plenty of water, for at least 15 minutes.
Get medical attention.

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PRODUCT: SODIUM METABISULFITE

ORDER NO:
PROD NO :

C. HAZARDS INFORMATION

HEALTH -

INHALATION: Inhalation of product dust or mist may irritate respiratory tract.

INGESTION: May irritate gastrointestinal tract. Very large doses cause violent colic, diarrhea, depression, and death. Reference (b). May cause severe allergic reaction in some asthmatics and sulfite sensitive individuals.

SKIN: Repeated or prolonged contact with dust may cause irritation.

Contact with solution will irritate. See pH, Section F.

EYES: Dust or mist may irritate or burn eyes. Solutions will irritate or burn. See pH, Section F.

PERMISSIBLE CONCENTRATION: AIR: (SEE SECTION J)

TLV: 5 mg/M3

BIOLOGICAL: None established.

UNUSUAL CHRONIC TOXICITY: None known.

FIRE AND EXPLOSION -

FLASH POINT: Not flammable.

AUTO IGNITION TEMPERATURE: NA

FLAMMABLE LIMITS IN AIR (% BY VOL.): LOWER - NA UPPER - NA

UNUSUAL FIRE AND EXPLOSION HAZARDS: See Hazardous Decomposition Products, Section G.

D. PRECAUTIONS/PROCEDURES

~~FIRE EXTINGUISHING AGENTS RECOMMENDED: NA~~

FIRE EXTINGUISHING AGENTS TO AVOID: NA

SPECIAL FIRE FIGHTING PRECAUTIONS: Wear NIOSH-approved self-contained breathing apparatus.

VENTILATION: Local exhaust if dusty or misty condition prevails. The TLV may be exceeded without visual warning.

NORMAL HANDLING: Avoid contact with eyes, skin, clothing. Avoid breathing dust or mist. Use normal personal hygiene and housekeeping. Keep away from water or acids or heat.

STORAGE: Cool, dry, well-ventilated space away from acids and oxidizing agents. (Try to avoid tendency of product to cake). Releases sulfur dioxide gas slowly at ambient temperatures - see odor, Section F).

SPILL OR LEAK (ALWAYS WEAR PERSONAL PROTECTIVE EQUIPMENT - SECTION E): Promptly sweep up with minimum dusting and shovel into an empty container and close. Cautiously spray residue with plenty of water. Provide ventilation to clear sulfur dioxide fumes which will be generated as a result of water contact. (See Section I for disposal methods.)

SPECIAL: PRECAUTIONS/PROCEDURES/LABEL INSTRUCTIONS: SIGNAL WORD - DANGER! Avoid contact with acid and oxidizers.

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MSDS NO: GZ003067
EFFECTIVE DATE: 11/23/92

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ORDER NO:
PROD NO :

E. PERSONAL PROTECTIVE EQUIPMENT

RESPIRATORY PROTECTION: Where required, use a NIOSH-approved respirator for dust, mist, and/or sulfur dioxide gas, as conditions indicate. Some exposures may require NIOSH-approved self-contained breathing apparatus or supplied-air respirator.

EYES AND FACE: Wear hard hat (or other head covering) and chemical safety goggles. Do not wear contact lenses.

HANDS, ARMS, AND BODY: For handling dry material, wear cotton gloves and full work-clothing, including long-sleeved shirt and trousers. When handling solutions and there is prolonged or repeated contact, wear impervious gloves, clothing and boots.

OTHER CLOTHING AND EQUIPMENT: Eye-wash/safety shower facility

F. PHYSICAL DATA

MATERIAL IS (AT NORMAL CONDITIONS): SOLID

APPEARANCE AND ODDOR: Fine, white granular product. Pungent sulfur dioxide gas odor.

BOILING POINT: Decomposes above 150 Degrees C

MELTING POINT: Decomposes above 150 Degrees C

SPECIFIC GRAVITY (H2O=1): 1.48

VAPOR DENSITY (AIR=1): NA

SOLUBILITY IN WATER (% by Weight): 39% at 16 Degrees C

pH: 1% Solution, pH = 4.3 (approx.)

VAPOR PRESSURE: NA

EVAPORATION RATE: NA

% VOLATILES BY VOLUME (At 20 Degrees C): NA

G. REACTIVITY DATA

STABILITY: STABLE

CONDITIONS TO AVOID: Temperatures above 150 Degrees C cause evolution of toxic and corrosive gas (sulfur dioxide).

INCOMPATIBILITY (MATERIALS TO AVOID): Oxidizers may cause strong exothermic reactions. Acids yield sulfur dioxide gas, which is toxic and corrosive. Water increases the natural rate of yield of sulfur dioxide gas.

HAZARDOUS DECOMPOSITION PRODUCTS: Sulfur dioxide gas; see comments in INCOMPATIBILITY (MATERIALS TO AVOID). Sodium sulfide residue; flammable, dangerous fire risk, strong irritant to skin and tissue, incompatible with acids.

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR

CONDITIONS TO AVOID: NA

H. HAZARDOUS INGREDIENTS (Mixtures Only)

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PRODUCT: SODIUM METABISULFITE

ORDER NO:
PROD NO :

MATERIAL OR COMPONENT/C.A.S. #: NA

I. ENVIRONMENTAL

DEGRADABILITY/AQUATIC TOXICITY:

Aquatic toxicity;

120 ppm/24,48 & 96 hr/mosquito fish/Tlm/fresh water - Reference (b)
(converting bisulfite figure to metabisulfite basis).

OCTANOL/WATER PARTITION COEFFICIENT: ND

EPA HAZARDOUS SUBSTANCES (CLEAN WATER ACT SEC. 311): YES

IF SO REPORTABLE QUANTITY: 5000# (40 CFR 116-117)

WASTE DISPOSAL METHODS (DISPOSER MUST COMPLY WITH FEDERAL, STATE AND LOCAL DISPOSAL OR DISCHARGE LAWS): Neutralize with alkali and flush to sewer with plenty of water if permitted by applicable disposal regulations. Good ventilation is required during neutralization because of the release of SO₂ gas. Oxidation to sodium sulfate solution is required prior to disposal. This may be done by adding a slight excess of dilute hydrogen peroxide carefully and with stirring. Neutralized or oxidized waste may have to be disposed of by an approved contractor.

RCRA STATUS OF UNUSED MATERIAL IF DISCARDED: Not a "hazardous waste".

HAZARDOUS WASTE NUMBER: (IF APPLICABLE): (40 CFR 261)

J. REFERENCES

PERMISSIBLE CONCENTRATION REFERENCES:

(1) "Threshold Limit Values for Chemical Substances", ACGIH, 1987/88.

REGULATORY STANDARDS:

FDA regulations apply to use of food and NF grades (21 CFR). Food use in meats or in food recognized as a source of vitamin B1 is prohibited (21 CFR 132.3766).

D.O.T. CLASSIFICATION: ORM-B I.D. No. NA 2693 (49 CFR 173)

GENERAL:

(a) ACGIH, Documentation of the Threshold Limit Values, 4th ED., 1981, Am. Conf. of Governmental Industrial Hygienists, Cincinnati 45202 - a review for this material with 4 references.

(b) Coast Guard CHRIS system form covering Sodium Bisulfite and Metabisulfite, "SBS", October, 1978.

K. ADDITIONAL INFORMATION

This product is not for food or drug use unless material is labeled "food grade" or "NF grade," as applicable.

For food grade product, the following applies;

(1) Effective August 8, 1987, the F.D.A. has banned the use of "Sulfiting Agents" or "Sulfites" on fruits and vegetables intended to be served raw or sold raw to consumers.

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- (2) Effective January 9, 1987, the F.D.A. is requiring when a sulfite is present in a detectable amount in a finished food, regardless of whether it has been directly or indirectly added via one or more of the food ingredients, it must be declared on the label. The regulation defines a "detectable amount" of sulfite to be 10 ppm.
- (3) Sulfiting agents or sulfites are not to be used on foods or meats recognized as source of Vitamin B1.

FOOTNOTE: ND = NOT DETERMINED NA = NOT APPLICABLE
 * = PROPRIETARY - TRADE SECRET

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

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

03/15/94 10:45 PRODUCT: CUST NO: ORDER NO:

----- NOTICE -----

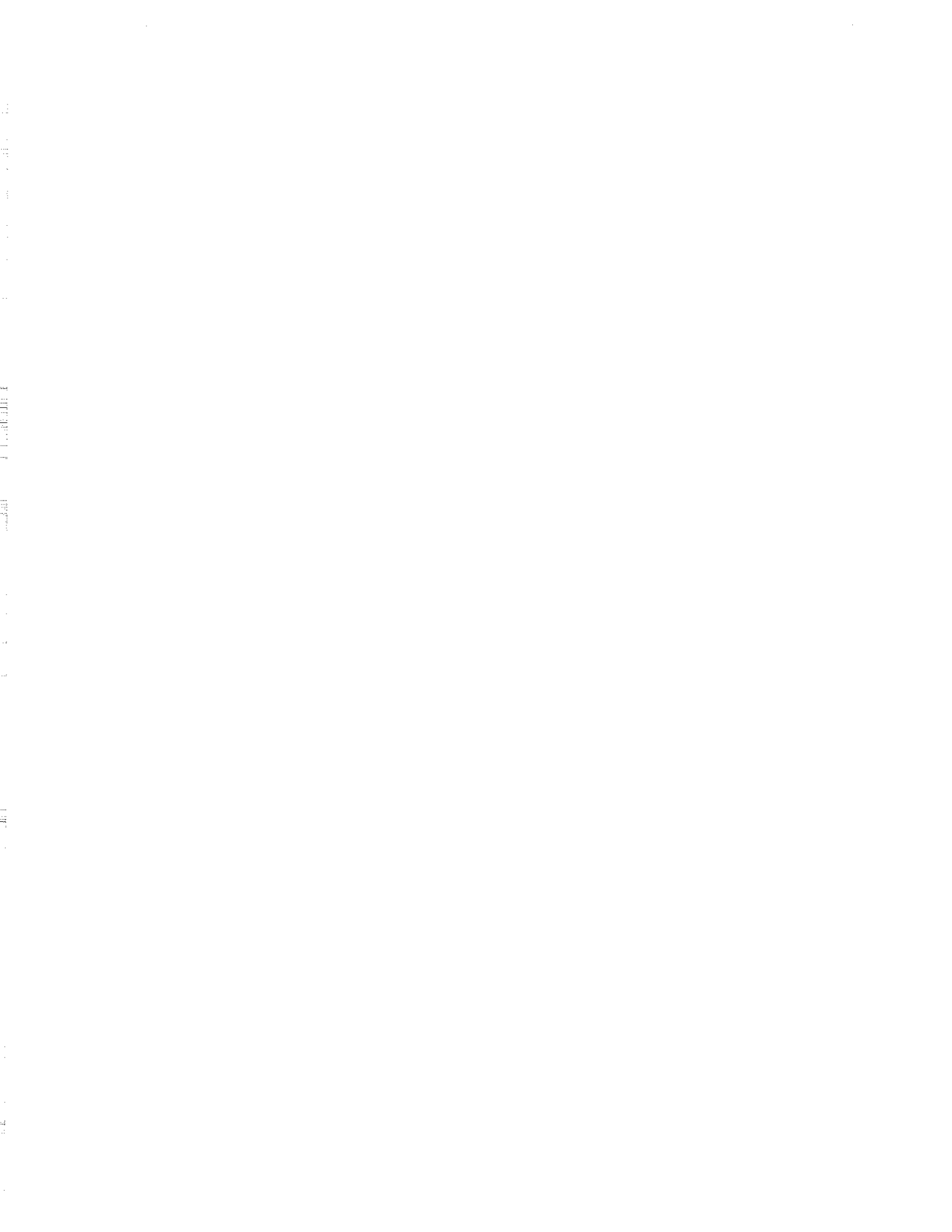
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* * * E N D O F M S D S * * *



10-1070 Reel 3-18-99

REPORT NUMBER: 971
MSDS NO: P1436VS
EFFECTIVE DATE: 02/04/93

VAN WATERS & ROGERS INC.
MATERIAL SAFETY DATA SHEET

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PRODUCT: POTASSIUM PERMANGANATE

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
UW&R SPOKANE 509-534-0405 SPOKANE , WA

PRODUCT IDENTIFICATION

PRODUCT NAME: POTASSIUM PERMANGANATE
MSDS #: P1436VS
DATE ISSUED: 01/91
ISSUED BY: 008237

MANUFACTURER'S MSDS

Material Safety Data Sheet

Potassium Permanganate

NFPA* HAZARD SIGNAL

Health Hazard
(less than 1 hour exposure)

1 = Materials which under fire conditions would give off irritating combustion products.
Materials which on the skin could cause irritation.

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Flammability Hazard 0 = Materials that will not burn.
Reactivity Hazard 0 = Materials which in themselves are normally stable, even under fire exposure conditions, and which are not reactive with water.
Special Hazard OXY = Oxidizer

*National Fire Protection Association 704

Section I Product Identification

MANUFACTURER'S NAME: CARUS CORPORATION

TELEPHONE NUMBER FOR INFORMATION: 1-815/433-9070

MANUFACTURING Carus Chemical Company
FACILITY: 1500 Eighth Street
 LaSalle, IL 61301

EMERGENCY TELEPHONE NO.: 1-800/435-4856
CHEMTREC TELEPHONE NO.: 1-800/424-9300

PRODUCT NAME: Potassium Permanganate, KMnO4

TRADE NAME: Potassium Permanganate

SYNONYMS: Permanganic acid potassium salt
 Chameleon mineral
 Condy's crystals
 Permanganate of potash

DEPARTMENT OF TRANSPORTATION INFORMATION:

Proper Shipping Name: 49CFR172.101	Potassium Permanganate
ID Number: 49CFR172.101	UN 1490
Hazard Class: 49CFR172.101	Oxidizer
Multiple Labeling Requirements: 49CFR172.402(a)(9)	Corrosive
Hazardous Substance	
Reportable Quantity: 40CFR116.4; 40CFR302.4	RQ-100 lb.

Chemtrec Telephone No. (800) 424-9300

RCRA: Oxidizers such as potassium permanganate meet the criteria of ignitable waste. 40 CFR261.21

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PRODUCT: POTASSIUM PERMANGANATE

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PROD NO :

Registry of Toxic Effects of Chemical Substances
RTECS #806475000

Potassium Permanganate contains 33-35% manganese as part of the chemical infrastructure (manganese compounds CAS Reg. No. N/A) and is subject to the reporting requirements of Section 313 of Title III, Superfund Amendments and Reauthorization Act of 1986 and 40 CFR372.

FIRST RESPONDERS:

Wear protective gloves, boots, goggles, and respirator. In case of fire, wear positive pressure breathing apparatus. Approach incident with caution. Use Emergency Response Guide 35 (DOT P5800.4).

Section II Hazardous Ingredients

Material or component	CAS No.*	%	Hazard Data
Potassium Permanganate	7722-64-7	97%min. KMnO4	PEL** C**** 5 mg Mn per cubic meter of air TLV-TWA*** 5 mg Mn per cubic meter of air 5 mg Mn per cubic meter of air i equivalent to 0.0046 ounces per 1000 cubic feet of air.

*Chemical Abstract Service Number

**OSHA Permissible Exposure Limit, manganese compounds (expressed as Mn)
29CFR1910.1000 Table ZA1.

***American Conference of Governmental Hygienists 1988/1989, for manganese dust and compounds, expressed as Mn. TLV-TWA = The time weighted average concentration for a normal 8 hour workday and a 40 hour workweek, to which nearly all workers may be repeatedly exposed, day after day, without adverse effect.

****Ceiling Exposure Limit or maximum exposure concentration not to be exceeded under any circumstances.

Section III Physical Data

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BOILING POINT, 760 mm Hg
Not applicable

SPECIFIC GRAVITY
2.7 g/cm³ 20 Deg. C (68 Deg. F)

VAPOR PRESSURE (mm Hg)
Not applicable

VAPOR DENSITY (AIR = 1)
Not applicable

SOLUBILITY IN WATER % BY SOLUTION
6.0% at 20 Deg. C (68 Deg. F); and 20% at 45 Deg. C (147 Deg. F)

PERCENT VOLATILE BY VOLUME
Not Volatile

EVAPORATION RATE (BUTYL ACETATE = 1)
Not applicable

MELTING POINT
Starts to decompose with evolution of oxygen (O₂) at temperatures above 150
Deg. C (302 Deg. F)

APPEARANCE AND ODOR
Dark purple solid with a metallic luster, odorless

Section IV Fire and Explosion Hazard Data

The material itself is noncombustible but will accelerate the burning of
combustible material.

FLASHPOINT
None

FLAMMABLE OR EXPLOSIVE LIMITS
Lower: Nonflammable Upper: Nonflammable

EXTINGUISHING MEDIA
Use large quantities of water

SPECIAL FIREFIGHTING PROCEDURES
Watch for rapid burning and be prepared to retreat to a safe distance. If
yellow, white or brown fumes are present, wear positive pressure breathing

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apparatus and full protective clothing.

UNUSUAL FIRE AND EXPLOSION HAZARDS

Powerful oxidizing material. May decompose spontaneously if exposed to intense heat (150 Deg. C/302 Deg. F). May be explosive in contact with some other chemicals. May react violently with finely divided and readily oxidizable substance. Increases flammability of combustible materials.

Section V Health Hazard Data

POTASSIUM PERMANGANATE:

Acute oral LD50(rat). = 780 mg/kg Male (14 days) 525 mg/kg Female (14 days)
The fatal dose by ingestion is estimated to be 10 grams or 0.35 ounces.

ROUTES OF EXPOSURE

1. Inhalation

Acute inhalation toxicity data are not available; however, airborne concentrations of potassium permanganate in the form of dust, mist, or spray may irritate and cause damage to the respiratory tract.

2. Skin Contact

Prolonged contact of solutions at room temperature may be irritating to the skin, leaving brown stains on the skin. Concentrated solutions at elevated temperature and crystals are corrosive to the skin.

3. Eye Contact

Potassium permanganate is corrosive to eye tissue on contact. It may cause severe burns that result in damage to the eye.

4. Ingestion

Potassium permanganate, if swallowed, may cause severe burns to mucous membranes of the mouth, throat, esophagus, and stomach.

EFFECTS OF OVEREXPOSURE

1. Acute Overexposure (instantaneous overexposure)

Irritating or corrosive to body tissue on contact

2. Chronic Overexposure (long term overexposure)

Prolonged exposure, usually many years, to heavy concentrations of dust and fumes above the TLV-value, mainly in the form of manganese oxides may lead to lung irritation and central nervous system disorder. The symptoms may simulate Parkinson's disease. No known cases of central nervous system disorders due to exposure to $KMnO_4$ have been reported.

PRODUCT: POTASSIUM PERMANGANATE

ORDER NO:
PROD NO :

3. Carcinogenicity

Potassium permanganate has not been classified as a carcinogen by OSHA, NTP, IARC.

4. Medical Conditions Generally Aggravated by Exposure

Potassium permanganate will cause further irritation of tissue or open wounds, burns and mucous membranes.

EMERGENCY AND FIRST AID PROCEDURES

1. Eyes

Immediately flush eyes with large amounts of water for at least 15 minutes holding lids apart to ensure flushing of the entire surface. Do not attempt to use a chemical antidote. Seek medical attention immediately.

2. Skin

Immediately wash contaminated areas with plenty of water. Remove contaminated clothing and footwear. Wash clothing and decontaminate footwear before use. Seek medical attention immediately if irritation is severe.

3. Inhalation

Get person out of contaminated area to fresh air. If breathing has stopped, resuscitate and administer oxygen if readily available. Seek medical attention immediately.

4. Ingestion

Never give anything by mouth to an unconscious or convulsing person. If conscious, give large quantities of water. Seek medical attention immediately.

Section VI Reactivity Data

STABILITY

Under normal conditions, the material is stable.

CONDITIONS TO AVOID

Contact with incompatible materials or heat (>150 Deg. C/302 Deg. F) Do not mix with formaldehyde.

INCOMPATIBLE MATERIALS

Contact with acids, peroxides, and all combustible organic or readily oxidizable materials including inorganic oxidizable materials and metal powders. With hydrochloric acid, chlorine gas is liberated.

HAZARDOUS DECOMPOSITION PRODUCTS

When involved in fire, corrosive fumes or smoke may be formed.

PRODUCT: POTASSIUM PERMANGANATE

ORDER NO:
PROD NO :

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

Material is not known to polymerize.

Section VII Spill or Leak Procedures

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED

Clean up spills immediately by sweeping or shoveling up the material; do not return contaminated material to original drum. Transfer to a clean metal drum. EPA banned the land disposal of D001 ignitable waste oxidizers. These wastes have to be deactivated by reduction (see below). To clear contaminated floors flush with abundant quantities of water into sewer, if permitted by Federal, State, and Local regulations. If not, collect water and treat chemically. (See below)

DEACTIVATION OF D001 IGNITABLE WASTE OXIDIZERS BY CHEMICAL REDUCTION

Reduce material in aqueous solution with sodium thiosulfate (Hypo), a bisulfite or ferrous salt solution. The bisulfite or ferrous salt may require some dilute sulfuric acid to promote rapid reduction. Neutralize with sodium bicarbonate to neutral pH if acid was used. Decant or filter and mix formed sludge with sodium carbonate and deposit in an approved landfill. Where permitted, the sludge can be drained into sewer with large quantities of water. Contact Carus Chemical for additional recommendations.

Section VIII Protective Equipment to Be Used

VENTILATION REQUIREMENTS

Provide sufficient mechanical and/or local exhaust to maintain exposure below the Permissible Exposure Limit.

RESPIRATORY PROTECTION

In the case where overexposure may exist, the use of NIOSH-MSHA dust and mist respirator (such as NIOSH-MSHA TC-21C-287) or an air supplied respirator is advised. Engineering or administrative controls should be implemented to control dust.

EYE

Face shield and/or goggles should be worn.

GLOVES

Rubber or plastic gloves should be worn.

OTHER PROTECTIVE EQUIPMENT

Normal work clothing covering arms and legs and rubber apron should be worn.

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WORK/HYGIENIC PRACTICES

Wash thoroughly with soap and water after handling and before eating or smoking.

Section IX Special Precautions and Other Comments

Protect containers against physical damage. Store in a cool, dry area in closed containers. Segregate from acids, peroxides and all combustible, organic or easily oxidizable materials.

DEPARTMENT OF TRANSPORTATION INFORMATION:

Proper Shipping Name: 49CFR172.101	Potassium Permanganate
ID Number: 49CFR172.101	UN 1490
Hazard Class: 49CFR172.101	Oxidizer
Multiple Labeling Requirements: 49CFR172.402(a)(9)	Corrosive
Hazardous Substance	
Recertable Quantity: 40CFR116.4; 40CFR302.4	RQ-100 lb.

Chemtrec Telephone No. (800) 424-9300

FIRST RESPONDERS:

Wear protective gloves, boots, goggles, and respirator. In case of fire, wear positive pressure breathing apparatus. Approach incident with caution. Use Emergency Response Guide 35 (DOT P5800.4).

RCRA: Oxidizers as potassium permanganate meet the criteria of ignitable waste. 40 CFR261.21

Registry of Toxic Effects of Chemical Substances
RTECS #SD6475000

CAIROX(R) Potassium Permanganate contains 33-35% manganese as part of the chemical infrastructure (manganese compounds CAS Reg. No. N/A) and is subject to the reporting requirements of Section 313 of Title III, Superfund Amendments and Reauthorization Act of 1986 and 40 CFR372.

Name: Horst R. Adolf
Signature: /s/ Horst R. Adolf
Revision Date: January 1991

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