SIGMA-ALDRICH 2004.3
MATERIAL SAFETY DATA SHEET

Date Printed: 07/09/2004
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Version Legacy

Product Name	MANGANESE(II) CHLORIDE, ANHYDROUS, 98%
Product Number	333409
Brand	ALDRICH
Company	Sigma-Aldrich
Street Address	3050 Spruce Street
City, State, Zip, Country	SAINT LOUIS, MO 63103 USA
Technical Phone:	314 771 5765
Emergency Phone:	414 273 3850 Ext. 5996
Fax:	800 325 5052

SECTION 1. - - - - - - - - - CHEMICAL IDENTIFICATION- - - - - - - - - -
CATALOG #: 333409
NAME: MANGANESE(II) CHLORIDE, ANHYDROUS, 98%
SECTION 2. - - - - - COMPOSITION/INFORMATION ON INGREDIENTS - - - - - -
CAS #: 7773-01-5
MF: CL2MN
EC NO: 231-869-6
SYNONYMS
MANGANESE CHLORIDE * MANGANESE DICHLORIDE * MANGANOUS CHLORIDE *
SECTION 3. - - - - - - - - - - HAZARDS IDENTIFICATION - - - - - - - - - -
LABEL PRECAUTIONARY STATEMENTS
TOXIC (USA)
HARMFUL (EU)
HARMFUL BY INHALATION, IN CONTACT WITH SKIN AND IF SWALLOWED.
IRRITATING TO EYES, RESPIRATORY SYSTEM AND SKIN.
LIMITED EVIDENCE OF CARCINOGENIC EFFECT.
POSSIBLE MUTAGEN.
TARGET ORGAN(S):
NERVES
LUNGS
IN CASE OF CONTACT WITH EYES, RINSE IMMEDIATELY WITH PLENTY OF WATER AND SEEK MEDICAL ADVICE.
TAKE OFF IMMEDIATELY ALL CONTAMINATED CLOTHING.
WEAR SUITABLE PROTECTIVE CLOTHING, GLOVES AND EYE/FACE PROTECTION.
VERY HYGROSCOPIC
STORE UNDER NITROGEN.
SECTION 4. - - - - - - - - - - FIRST-AID MEASURES- - - - - - - - - - -
IF SWALLOWED, WASH OUT MOUTH WITH WATER PROVIDED PERSON IS CONSCIOUS.
CALL A PHYSICIAN.
IF INHALED, REMOVE TO FRESH AIR. IF NOT BREATHING GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN.
IN CASE OF SKIN CONTACT, FLUSH WITH COPIOUS AMOUNTS OF WATER FOR AT LEAST 15 MINUTES. REMOVE CONTAMINATED CLOTHING AND SHOES. CALL A PHYSICIAN.
IN CASE OF CONTACT WITH EYES, FLUSH WITH COPIOUS AMOUNTS OF WATER FOR AT LEAST 15 MINUTES. ASSURE ADEQUATE FLUSHING BY SEPARATING THE EYELIDS WITH FINGERS. CALL A PHYSICIAN.
SECTION 5. - - - - - - - - - FIRE FIGHTING MEASURES - - - - - - - - - -
EXTINGUISHING MEDIA
WATER SPRAY.
CARBON DIOXIDE, DRY CHEMICAL POWDER OR APPROPRIATE FOAM.

SPECIAL FIREFIGHTING PROCEDURES
WEAR SELF-CONTAINED BREATHING APPARATUS AND PROTECTIVE CLOTHING TO PREVENT CONTACT WITH SKIN AND EYES.
UNUSUAL FIRE AND EXPLOSIONS HAZARDS
EMITS TOXIC FUMES UNDER FIRE CONDITIONS.

SECTION 6. - - - - - - - - - ACCIDENTAL RELEASE MEASURES- - - - - - - - -

WEAR SELF-CONTAINED BREATHING APPARATUS, RUBBER BOOTS AND HEAVY RUBBER GLOVES.
ABSORB ON SAND OR VERMICULITE AND PLACE IN CLOSED CONTAINERS FOR DISPOSAL.
VENTILATE AREA AND WASH SPILL SITE AFTER MATERIAL PICKUP IS COMPLETE.
EVACUATE AREA.

SECTION 7. - - - - - - - - - - HANDLING AND STORAGE- - - - - - - - - - -

REFER TO SECTION 8.

SECTION 8. - - - - - - EXPOSURE CONTROLS/PERSONAL PROTECTION- - - - - -

USE ONLY IN A CHEMICAL FUME HOOD.
SAFETY SHOWER AND EYE BATH.
WASH THOROUGHLY AFTER HANDLING.
DO NOT BREATHE VAPOR.
AVOID CONTACT WITH EYES, SKIN AND CLOTHING.
AVOID PROLONGED OR REPEATED EXPOSURE.
NIOSH/MSHA-APPROVED RESPIRATOR.
COMPATIBLE CHEMICAL-RESISTANT GLOVES.
CHEMICAL SAFETY GOGGLES.
KEEP TIGHTLY CLOSED.

SECTION 9. - - - - - - - PHYSICAL AND CHEMICAL PROPERTIES - - - - - - -

APPEARANCE AND ODOR
PINK POWDER

SECTION 10. - - - - - - - - -STABILITY AND REACTIVITY - - - - - - - - -

STABILITY
STABLE.
INCOMPATIBILITIES
STRONG OXIDIZING AGENTS
HAZARDOUS COMBUSTION OR DECOMPOSITION PRODUCTS
CARBON MONOXIDE, CARBON DIOXIDE
HAZARDOUS POLYMERIZATION
WILL NOT OCCUR.

SECTION 11. - - - - - - - - - TOXICOLOGICAL INFORMATION - - - - - - - -

ACUTE EFFECTS
MAY CAUSE SKIN IRRITATION.
HARMFUL IF ABSORBED THROUGH SKIN.
MAY CAUSE EYE IRRITATION.
HARMFUL IF INHALED.
MATERIAL MAY BE IRRITATING TO MUCOUS MEMBRANES AND UPPER RESPIRATORY TRACT.
HARMFUL IF SWALLOWED.
TO THE BEST OF OUR KNOWLEDGE, THE CHEMICAL, PHYSICAL, AND TOXICOLOGICAL PROPERTIES HAVE NOT BEEN THOROUGHLY INVESTIGATED.
CHRONIC EFFECTS
TARGET ORGAN(S):
NERVES
LUNGS
TESTES
MALE REPRODUCTIVE SYSTEM
LABORATORY EXPERIMENTS HAVE SHOWN MUTAGENIC EFFECTS.
OVEREXPOSURE MAY CAUSE REPRODUCTIVE DISORDER(S) BASED ON TESTS WITH LABORATORY ANIMALS.
RTECS #: OO9625000
MANGANESE(II) CHLORIDE (1:2)
TOXICITY DATA

ORL-RAT LD50:250 MG/KG GISAAA 26(12),8,1961
IPR-RAT LD50:147 MG/KG INJPD2 23,153,1991
IVN-RAT LD50:92600 UG/KG INJPD2 23,153,1991
IMS-RAT LD50:700 MG/KG RPTOAN 38,221,1975
ORL-MUS LD50:1031 MG/KG GISAAA 36(9),15,1971
IPR-MUS LD50:121 MG/KG AEPPAE 244,17,1962
IVN-MUS LD50:38 MG/KG ACRAE3 38,770,1997
IMS-MUS LD50:255 MG/KG RPTOAN 38,221,1975
IVN-DOG LD50:202 MG/KG EQSSDX 1,1,1975
ORL-GPG LD50:916 MG/KG GISAAA 36(9),15,1971

TARGET ORGAN DATA
BEHAVIORAL (SOMNOLENCE)
BEHAVIORAL (TREMOR)
BEHAVIORAL (CONVULSIONS OR EFFECT ON SEIZURE THRESHOLD)
BEHAVIORAL (ATAXIA)
CARDIAC (OTHER CHANGES)
VASCULAR (BP LOWERING NOT CHARACTERIZED IN AUTONOMIC SECTION)
LUNGS, THORAX OR RESPIRATION (RESPIRATORY STIMULATION)
LUNGS, THORAX OR RESPIRATION (OTHER CHANGES)
GASTROINTESTINAL (OTHER CHANGES)
PATERNAL EFFECTS (TESTES, EPIDIDYMIS, SPERM DUCT)
EFFECTS ON FERTILITY (PRE-IMPLANTATION MORTALITY)
EFFECTS ON FERTILITY (POST-IMPLANTATION MORTALITY)
EFFECTS ON EMBRYO OR FETUS (FETOTOXICITY)
SPECIFIC DEVELOPMENTAL ABNORMALITIES (MUSCULOSKELETAL SYSTEM)
ONLY SELECTED REGISTRY OF TOXIC EFFECTS OF CHEMICAL SUBSTANCES (RTECS) DATA IS PRESENTED HERE. SEE ACTUAL ENTRY IN RTECS FOR COMPLETE INFORMATION.

SECTION 12. - - - - - - - - - ECOLOGICAL INFORMATION - - - - - - - - - -

DATA NOT YET AVAILABLE.

SECTION 13. - - - - - - - - - DISPOSAL CONSIDERATIONS - - - - - - - - -

CONTACT A LICENSED PROFESSIONAL WASTE DISPOSAL SERVICE TO DISPOSE OF THIS MATERIAL.
DISSOLVE OR MIX THE MATERIAL WITH A COMBUSTIBLE SOLVENT AND BURN IN A CHEMICAL INCINERATOR EQUIPPED WITH AN AFTERBURNER AND SCRUBBER.
OBSERVE ALL FEDERAL, STATE AND LOCAL ENVIRONMENTAL REGULATIONS.

SECTION 14. - - - - - - - - - - TRANSPORT INFORMATION - - - - - - - - -

CONTACT ALDRICH CHEMICAL COMPANY FOR TRANSPORTATION INFORMATION.

SECTION 15. - - - - - - - - - REGULATORY INFORMATION - - - - - - - - - -

EUROPEAN INFORMATION
HARMFUL
R 20/21/22
HARMFUL BY INHALATION, IN CONTACT WITH SKIN AND IF SWALLOWED.
R 36/37/38
IRRITATING TO EYES, RESPIRATORY SYSTEM AND SKIN.
R 40
LIMITED EVIDENCE OF CARCINOGENIC EFFECT.
S 26
IN CASE OF CONTACT WITH EYES, RINSE IMMEDIATELY WITH PLENTY OF WATER AND SEEK MEDICAL ADVICE.
S 27
TAKE OFF IMMEDIATELY ALL CONTAMINATED CLOTHING.
S 36/37/39
WEAR SUITABLE PROTECTIVE CLOTHING, GLOVES AND EYE/FACE PROTECTION.

REVIEWS, STANDARDS, AND REGULATIONS
OEL=MAK
ACGIH TLV-TWA 0.2 MG(MN)/M3 DTLVS* TLV/BEI,1999
MSHA STANDARD-AIR:CL 5 MG(MN)/M3
DTLVS* 3,149,1971

OSHA PEL (GEN INDU):CL 5 MG(MN)/M3
CFRGBR 29,1910.1000,1994
OSHA PEL (CONSTRUC):CL 5 MG(MN)/M3
CFRGBR 29,1926.55,1994
OSHA PEL (SHIPYARD):CL 5 MG(MN)/M3
CFRGBR 29,1915.1000,1993
OSHA PEL (FED CONT):CL 5 MG(MN)/M3
CFRGBR 41,50-204.50,1994
OEL-AUSTRALIA: TWA 5 MG(MN)/M3, JAN1993
OEL-BELGIUM: TWA 5 MG(MN)/M3, JAN1993
OEL-DENMARK: TWA 2.5 MG(MN)/M3, JAN1999
OEL-FINLAND: TWA 0.5 MG(MN)/M3, JAN1999
OEL-HUNGARY: TWA 0.3 MG(MN)/M3, STEL 0.6 MG(MN)/M3, JAN1993
OEL-JAPAN: OEL 0.3 MG(MN)/M3, RESPIRABLE DUST, JAN1999
OEL-THE NETHERLANDS: MAC-TGG 1 MG(MN)/M3, MAC-K 3 MG(MN)/M3, JAN1999
OEL-POLAND: MAC(TWA) 0.3 MG(MN)/M3, MAC(C) 5 MG(MN)/M3, JAN1999
OEL-SWEDEN: NGV 1 MG(MN)/M3, TGV 2.5 MG(MN)/M3 (RESP. DUST), JAN1993
OEL-SWEDEN: NGV 2.5 MG(MN)/M3, TGV 5 MG(MN)/M3 (TOTAL DUST), JAN1993
OEL-UNITED KINGDOM: TWA 5 MG(MN)/M3, SEP2000
OEL IN ARGENTINA, BULGARIA, COLOMBIA, JORDAN, KOREA CHECK ACGIH TLV;
OEL IN NEW ZEALAND, SINGAPORE, VIETNAM CHECK ACGIH TLV
NOHS 1974: HZD 84353; NIS 7; TNF 320; NOS 12; TNE 4916
NOES 1983: HZD 84353; NIS 6; TNF 788; NOS 16; TNE 13961; TFE 9451
EPA GENETOX PROGRAM 1988, POSITIVE: CELL TRANSFORM.-SA7/SHE; B SUBTILIS REC ASSAY
EPA TSCA SECTION 8(B) CHEMICAL INVENTORY
EPA TSCA TEST SUBMISSION (TSCATS) DATA BASE, JANUARY 2001

U.S. INFORMATION

THIS PRODUCT IS SUBJECT TO SARA SECTION 313 REPORTING REQUIREMENTS.

SECTION 16. - - - - - - - - - - OTHER INFORMATION- - - - - - - - - - - -

THE ABOVE INFORMATION IS BELIEVED TO BE CORRECT BUT DOES NOT PURPORT TO BE ALL INCLUSIVE AND SHALL BE USED ONLY AS A GUIDE. SIGMA, ALDRICH, FLUKA SHALL NOT BE HELD LIABLE FOR ANY DAMAGE RESULTING FROM HANDLING OR FROM CONTACT WITH THE ABOVE PRODUCT. SEE REVERSE SIDE OF INVOICE OR PACKING SLIP FOR ADDITIONAL TERMS AND CONDITIONS OF SALE.

MATERIAL SAFETY DATA SHEET

Fisher Science Education
A Fisher Scientific Company
fisheredu.com

15 Jet View Drive
Rochester, NY 14624
Tel: 1-800-955-1177
Fax: 1-800-955-0740

MSDS No.: MM0270
Effective Date: January 12, 2007

SECTION I NAME

Product	Mercuric Chloride
Chemical Synonyms	Mercury (II) Chloride; Mercury Bichloride
Formula	$HgCl_2$
Unit Size	up to 2.5 Kg.
C.A.S. No.	7487-94-7

24 HOUR EMERGENCY ASSISTANCE

CHEMTREC 800-424-9300
Day 585-226-6177

NFPA: 0 / 4 / 0

HMIS *

Health	4
Fire	0
Reactivity	1

HAZARD RATING

MINIMAL	SLIGHT	MODERATE	SERIOUS	SEVERE
0	1	2	3	4

SECTION II INGREDIENTS OF MIXTURES

Principal Component(s)	%	TLV Units
Mercuric chloride	100%	See Section V.
DANGER! POISON!		
CAUSES SEVERE BURNS. MAY BE FATAL IF SWALLOWED.		
HARMFUL IF INHALED OR ABSORBED THROUGH SKIN.		

SECTION III PHYSICAL DATA

Melting Point (°F)	276°C (529°F)	Specific Gravity (H_2O = 1)	5.44
Boiling Point (°F)	302°C (576°F)	Percent Volatile by Volume (%)	0 @ 21°C
Vapor Pressure (mm Hg)	Not applicable.	Evaporation Rate (=1)	Not applicable.
Vapor Density (Air=1)	8.7		
Solubility in Water	Moderate (1-10%).		
Appearance & Odor	White crystals or powder; no odor.		

SECTION IV FIRE AND EXPLOSION HAZARD DATA

Flash Point (Method Used)	Not flammable.	Flammable Limits in Air % by Volume	Lower	Upper
		N/A		
Extinguisher Media	Use any media suitable for extinguishing supporting fire.			

SPECIAL FIREFIGHTING PROCEDURES

Wear a NIOSH/MSHA-approved self-contained breathing apparatus with full facepiece operated in positive pressure mode and full protective clothing. Move containers from fire area if it can be done without risk. Use water to keep fire-exposed containers cool.

(2004 EMERGENCY RESPONSE GUIDEBOOK, RSPA P 5800.9, GUIDE PAGE NO. 154)

UNUSUAL FIRE AND EXPLOSION HAZARDS

Closed containers exposed to heat may explode. May produce toxic gases of hydrogen chloride and mercury vapors.

D.O.T. Mercuric chloride, 6.1, UN1624, PG II

Approved by U.S. Department of Labor "essentially similar" to form OSHA-20

SECTION V HEALTH HAZARD DATA MM0270

Threshold Limited Value: TLV-TWA: 0.1 mg/m^3 (ACGIH 2001).

Effects of Overexposure: **INHALATION:** Causes irritation of upper respiratory tract. **SKIN:** Causes severe irritation or burns. May cause allergic skin reaction. **EYES:** Causes severe irritation or burns. **INGESTION:** May be fatal, may cause headache, nausea, vomiting, gastrointestinal irritation, convulsions, unconsciousness. **CHRONIC EFFECTS:** Mercury build-up in the brain, liver and kidneys, may cause headache, shakes, loose teeth, loss of appetite, skin ulceration, impaired memory. May impair fertility. May cause harm to the unborn child. Target organs: Kidneys, central nervous system, reproductive system.

Emergency and First Aid Procedures: **INGESTION:** Call physician or Poison Control Center immediately. Induce vomiting only if advised by appropriate medical personnel. Never give anything by mouth to an unconscious person. **EYES:** Check for and remove contact lenses. Flush thoroughly with water for at least 15 minutes, lifting upper and lower eyelids occasionally. Get immediate medical attention. **SKIN:** Remove contaminated clothing. Flush thoroughly with mild soap and water. If irritation occurs, get medical attention. **INHALATION:** Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

SECTION VI REACTIVITY DATA

Stability			Conditions to Avoid
	Unstable		Excessive temperature or heat, friction, shock.
	Stable	X	

Incompatibility (Materials to Avoid): Strong acids, alkalies, carbonates, strong bases, amines and ammonia, most common metals, bromides, antimony, arsenic, sodium, potassium, metallic salts, albumin, gelatin, tannic acid, formates, sulfites, hypophosphites, phosphates.

Hazardous Decomposition Products: Hydrogen chloride, mercury fumes.

Hazardous Polymerization		Conditions to Avoid
May Occur	Will Not Occur	Not applicable.
	X	

SECTION VII SPILL OR LEAK PROCEDURES

Steps to be taken in case material is released or spilled: Ventilate area. Remove all sources of ignition. Wearing suitable protective clothing, sweep up and place in a suitable container for disposal. Wash spill area with soap and water.

Waste Disposal Method: Discharge, treatment, or disposal may be subject to Federal, State or Local laws. These disposal guidelines are intended for the disposal of catalog-size quantities only.

Dispose of in an approved chemical landfill or contract with a licensed waste disposal service. Follow local, state and federal regulations.

SECTION VIII SPECIAL PROTECTION INFORMATION

Respiration Protection (Specify Type): Work in ventilation hood. Wear a NIOSH/MSHA-approved respirator with organic mercury cartridge, if necessary.

Ventilation				
	Local Exhaust	Yes.	Special	No.
	Mechanical (General)	Yes.	Other	Adequate to maintain below exposure limit.

Protective Gloves	Rubber or plastic.	Eye Protection	Chemical safety goggles.

Other Protective Equipment: Faceshield, smock, apron, eye wash station, proper gloves, ventilation hood.

SECTION IX SPECIAL PRECAUTIONS

Precautions to be Taken in Handling & Storing
Keep container tightly closed when not in use.

Store in a cool, dry place away from strong oxidizing and reducing agents and fire hazards. Protect from light. Wash thoroughly after handling. Wash contaminated clothing before reuse.

Other Precautions: Read label on container before using. Do not wear contact lenses when working with chemicals. For laboratory use only. Not for drug, food or household use. Keep out of reach of children.

Use adequate ventilation. Do not breathe dust. Avoid contact with eyes or mucous membranes, or prolonged contact with skin. Keep away from food products.

Revision No. 8	Date 01/12/07	Approved James A. Bertsch	Chemical Safety Coordinator JAB

S80074

Fisher Scientific

Material Safety Data Sheet

Potassium iodate

MSDS# 19445

Section 1 - Chemical Product and Company Identification

MSDS Name:	Potassium iodate
Catalog Numbers:	AC196740000, AC196740025, AC196741000, AC196745000, AC201770000, AC201770025 AC201770025, AC201771000, AC201775000, AC418240000, AC418240025, AC418240050 AC418240050, AC418241000, 41824-5000, P253-100, P253-500
Synonyms:	Iodic acid, potassium salt.
Company Identification:	Fisher Scientific One Reagent Lane Fair Lawn, NJ 07410
For information in the US, call:	201-796-7100
Emergency Number US:	201-796-7100
CHEMTREC Phone Number, US:	800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#:	7758-05-6
Chemical Name:	Potassium iodate
%:	100
EINECS#:	231-831-9

Hazard Symbols: O

Risk Phrases: 22 8

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Danger! Strong oxidizer. Contact with other material may cause a fire. May cause kidney damage. May cause central nervous system effects. May cause severe eye, skin and respiratory tract irritation with possible burns. Target Organs: Kidneys, central nervous system.

Potential Health Effects

Eye:	May cause eye irritation. May cause conjunctivitis. May cause permanent corneal opacification.
Skin:	May cause severe irritation and possible burns.

Ingestion:	May cause burns to the gastrointestinal tract. May cause nausea, vomiting, and diarrhea, possibly with blood.
Inhalation:	May cause acute pulmonary edema, asphyxia, chemical pneumonitis, and upper airway obstruction caused by edema.
Chronic:	Prolonged or repeated skin contact may cause irritation. Prolonged or repeated exposure may cause gastrointestinal irritation and kidney damage. Chronic ingestion may cause central nervous system failure. Effects may be delayed.

Section 4 - First Aid Measures

Eyes:	Get medical aid. Immediately flush eyes with plenty of water for at least 15 minutes.
Skin:	Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists. Wash clothing before reuse.
Ingestion:	Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.
Inhalation:	Remove from exposure and move to fresh air immediately. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear. Do NOT use mouth-to-mouth resuscitation. If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask.
Notes to Physician:	

Section 5 - Fire Fighting Measures

General Information:	As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Strong oxidizer. Contact with other material may cause fire. Use water spray to keep fire-exposed containers cool. Use water with caution and in flooding amounts. This material is an explosion hazard when exposed to heat, mechanical shock, or friction. Containers may explode when heated. Runoff to sewer may create fire or explosion hazard.
Extinguishing Media:	Contact professional fire-fighters immediately. Cool containers with flooding quantities of water until well after fire is out. For small fires, do NOT use dry chemicals, carbon dioxide, halon or foams. USE WATER ONLY. For large fires flood fire with water from a distance.
Autoignition Temperature:	Not available.
Flash Point:	Not available
Explosion Limits: Lower:	Not available
Explosion Limits: Upper:	Not available
NFPA Rating:	; instability: OX

Section 6 - Accidental Release Measures

General Information:	Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks:	Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up, then place into a suitable container for disposal. Avoid generating dusty conditions. Keep combustibles (wood, paper, oil, etc.,) away from

spilled material.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid contact with clothing and other combustible materials. Keep from contact with clothing and other combustible materials. Avoid breathing dust. Inform laundry personnel of contaminant's hazards.

Storage: Do not store near combustible materials. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from flammable liquids. Keep away from reducing agents.

Section 8 - Exposure Controls, Personal Protection

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Potassium iodate	none listed	none listed	none listed

OSHA Vacated PELs: Potassium iodate: None listed

Engineering Controls:

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

Exposure Limits

Personal Protective Equipment

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

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate clothing to prevent skin exposure.

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

Section 9 - Physical and Chemical Properties

Physical State: Solid
Color: white
Odor: odorless
pH: Not available
Vapor Pressure: Not available
Vapor Density: Not available
Evaporation Rate: Not available
Viscosity: Not available
Boiling Point: Not available
Freezing/Melting Point: 560 deg C (1,040.00ï¿½F)
Decomposition Temperature:
Solubility in water: Soluble

Specific Gravity/Density: 3.89
Molecular Formula: KIO3
Molecular Weight: 214.00

Section 10 - Stability and Reactivity

Chemical Stability:	Stable under normal temperatures and pressures.
Conditions to Avoid:	High temperatures, dust generation.
Incompatibilities with Other Materials	Reducing agents, combustible materials, flammable liquids.
Hazardous Decomposition Products	Flammable liquids, oxides of potassium, iodine.
Hazardous Polymerization	Has not been reported.

Section 11 - Toxicological Information

RTECS#:	CAS# 7758-05-6: NN1350000
LD50/LC50:	RTECS: Not available.
Carcinogenicity:	Potassium iodate - Not listed as a carcinogen by ACGIH, IARC, NTP, or CA Prop 65.
Epidemiology:	Not available
Teratogenicity:	Not available
Reproductive:	Not available
Neurotoxicity:	Not available
Mutagenicity:	Not available
Other:	Not available

Section 12 - Ecological Information

Not available

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification. RCRA P-Series: None listed. RCRA U-Series: None listed.

Section 14 - Transport Information

US DOT
Shipping Name: OXIDIZING SOLID, N.O.S.
Hazard Class: 5.1
UN Number: UN1479
Packing Group: II
Canada TDG
Shipping Name: OXIDIZING SOLID NOS (POTASSIUM IODATE)
Hazard Class: 5.1
UN Number: UN1479
Packing Group: II

Section 15 - Regulatory Information

US Federal

TSCA

CAS# 7758-05-6 is listed on the TSCA

Inventory.

Health & Safety Reporting List	None of the chemicals are on the Health & Safety Reporting List.
Chemical Test Rules	None of the chemicals in this product are under a Chemical Test Rule.
Section 12b	None of the chemicals are listed under TSCA Section 12b.
TSCA Significant New Use Rule	None of the chemicals in this material have a SNUR under TSCA.
CERCLA Hazardous Substances and corresponding RQs	None of the chemicals in this material have an RQ.
SARA Section 302 Extremely Hazardous Substances	None of the chemicals in this product have a TPQ.
SARA Codes	CAS # 7758-05-6: flammable.
Section 313	No chemicals are reportable under Section 313.
Clean Air Act:	This material does not contain any hazardous air pollutants. This material does not contain any Class 1 Ozone depletors. This material does not contain any Class 2 Ozone depletors.
Clean Water Act:	None of the chemicals in this product are listed as Hazardous Substances under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.
OSHA:	
STATE	Potassium iodate is not present on state lists from CA, PA, MN, MA, FL, or NJ.
California Prop 65	
California No Significant Risk Level:	None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols: O

Risk Phrases:

R 22 Harmful if swallowed.

R 8 Contact with combustible material may cause fire.

Safety Phrases:

S 17 Keep away from combustible material.

WGK (Water Danger/Protection)

CAS# 7758-05-6: 1

Canada

CAS# 7758-05-6 is listed on Canada's DSL List

Canadian WHMIS Classifications: C

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

CAS# 7758-05-6 is not listed on Canada's Ingredient Disclosure List.

Section 16 - Other Information

MSDS Creation Date: 12/12/1997

Revision #8 Date 7/20/2009

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

INGRAM & BELL INC
20 BOND AVENUE
DON MILLS ONTARIO
CANADA M3B 1L9

Emergency#: 613-996-6666
Reference#: 416-444-7381
MSDS Rev. Date: 09/01/91

MATERIAL SAFETY DATA SHEET

MSDS NO: C3165
DATE: Sept. 1991

I IDENTIFIER

CONTROLLED PRODUCT - CLASS D - POISONOUS AND INFECTIOUS MATERIAL
CLASS E - CORROSIVE MATERIAL

EXPIRY DATED PRODUCT

SODA LIME INDICATING USP
(4-8 mesh with indicator)

C3165-42 2kg

HMIS CLASSIFICATION	RATING
Health Hazard:	2-Moderate
Flammability Hazard:	0-Minimal
Reactivity Hazard:	0-Minimal
Specific Hazard:	Toxic/ Corrosive

(HMIS - HAZARDOUS MATERIALS IDENTIFICATION SYSTEM
- CANADIAN PAINT AND COATINGS ASSOCIATION)

II PREPARATION

PREPARATION: INGRAM & BELL - QUALITY ASSURANCE DEPARTMENT
REVISION: Minor corrections

III CHEMICAL INGREDIENTS

HAZARDOUS MATERIAL	CONC.	CAS NO.	LD50	LC50
Calcium Hydroxide	>78% w/w	1305-62-0	7340mg/kg rat-oral	not avail.
Potassium Hydroxide	<5% w/w	1310-58-3	365mg/kg rat-oral	not avail.
Sodium Hydroxide	<3% w/w	1310-73-2	500mg/kg rabbit-oral	not avail.

NON HAZARDOUS MATERIAL (listed in decreasing concentration)

IV PHYSICAL DATA

PRODUCT USE:	alkaline carbon dioxide absorbent
PHYSICAL STATE:	solid
ODOUR & APPEARANCE:	white granular material with no odour
ODOUR THRESHOLD:	not available
SPECIFIC GRAVITY:	approximately 2(water=1)
VAPOUR PRESSURE:	not available
VAPOUR DENSITY:	not available
EVAPORATION RATE:	not available
BOILING POINT:	not applicable
FREEZING POINT:	below 4 deg C
pH:	not applicable

COEFFICIENT OF WATER/OIL DISTRIBUTION: not available

V FIRE AND EXPLOSION HAZARD

==========
FLAMMABLE: YES: NO: x

IF YES - CONDITIONS IT WILL BURN UNDER:

MEANS OF EXTINCTION: water, foam, fog, dry chemical

SPECIAL PROCEDURES: no special requirements

FLASH POINT: not flammable
UPPER FLAMMABILITY LIMIT: not applicable
LOWER FLAMMABILITY LIMIT: not applicable
AUTO-IGNITION TEMPERATURE: not available
HAZARDOUS COMBUSTION PRODUCTS: none known

EXPLOSION DATA:
SENSITIVITY TO IMPACT: stable
SENSITIVITY TO STATIC DISCHARGE: stable

==========
VI REACTIVITY DATA
==========
CHEMICAL STABILITY: YES: x NO:
IF NO - CONDITIONS UNDER WHICH NOT STABLE:

INCOMPATIBILITY TO OTHER SUBSTANCES: YES: x NO:
IF YES - LIST INCOMPATIBLE SUBSTANCES
will react (be neutralized) with acids
CONDITIONS OF REACTIVITY: contact

HAZARDOUS DECOMPOSITION PRODUCTS: may react with chloroform slightly to produce sodium formate, carbon monoxide and phosgene - may react with trichloroethylene to produce dichloracetylene, carbon monoxide and phosgene

==========
VII TOXICOLOGICAL PROPERTIES
==========
ROUTE OF ENTRY: SKIN CONTACT: x SKIN ABSORPTION:
INHALATION: x INGESTION: x
EYE CONTACT: x

EFFECTS OF ACUTE EXPOSURE:
EYES: severe irritant upon contact
SKIN: irritation upon direct contact
INHALATION: dust can cause irritation and injury to respiratory system
INGESTION: harmful if swallowed
EFFECTS OF CHRONIC EXPOSURE: not available

EXPOSURE LIMITS: from 2mg/m3 to 5mg/m3 (ACGIH, 1986)
IRRITANCY: may occur on contact or repeated exposure
SENSITIZATION: may occur in sensitive or allergic people
SYNERGISTIC MATERIALS: none known
CARCINOGENICITY, REPRODUCTIVE TOXICITY, TERATOGENICITY, MUTAGENICITY: not available

==========
VIII PREVENTATIVE MEASURES
==========
PROTECTIVE EQUIPMENT: GLOVES: rubber gloves
EYE PROTECTION: safety glasses
RESPIRATORY PROTECTION: not required
OTHER: not required

ENGINEERING CONTROLS: adequate ventilation

LEAK & SPILL PROCEDURE:
SMALL: scoop up area, wash area with soapy water and rinse
LARGE: sweep up area, wash area with soapy water and rinse
WASTE DISPOSAL: dispose of in accordance in federal, provincial and local requirements.

HANDLING PROCEDURES & EQUIPMENT: no special requirements - product used with highly flammable anesthetics must be kept away from heat, sparks or open flame as material residuals may be present
STORAGE PROCEDURES: store in cool dry place, protect from freezing, keep well sealed - Note: do not use any material exposed to below freezing temperatures.
SHIPPING INFORMATION: not required

IX FIRST AID

EYES: flush with water for at least 15 minutes, contact physician
SKIN: wash well with soap and water, if irritation persists contact physician
INHALATION: remove to fresh air
INGESTION: dilute with large amounts of water, do not induce vomiting contact physician immediately
OTHER INFORMATION: none

REFERENCES

information taken from supplier's MSDS

This MSDS is supplied by the Canadian Centre for Occupational Health & Safety.

Material Safety Data Sheet

Sodium bisulfite

MSDS# 21001

Section 1 - Chemical Product and Company Identification

MSDS Name:	Sodium bisulfite
Catalog Numbers:	AC223070000, AC223070010, AC419440000, AC419440010, AC419440025, AC419440050 AC419440050, AC419441000, S654-3, S654-3LC, S654-500
Synonyms:	Sodium hydrogen sulfite.
Company Identification:	Fisher Scientific One Reagent Lane Fair Lawn, NJ 07410
For information in the US, call:	201-796-7100
Emergency Number US:	201-796-7100
CHEMTREC Phone Number, US:	800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#:	7631-90-5
Chemical Name:	Sodium bisulfite
%:	99+
EINECS#:	231-548-0

Hazard Symbols: XN

Risk Phrases: 22 31

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Warning! Harmful if swallowed. Contact with acids liberates toxic gas. Target Organs: Respiratory system.

Potential Health Effects

Eye:	May cause eye irritation.
Skin:	May cause skin irritation. May be harmful if absorbed through the skin. May cause sensitization by skin contact.
Ingestion:	Harmful if swallowed. May cause irritation of the digestive tract.
Inhalation:	May cause respiratory tract irritation. May be harmful if inhaled. May cause respiratory sensitization.
Chronic:	Repeated or prolonged exposure may cause allergic reactions in sensitive individuals.

Section 4 - First Aid Measures

Eyes:	Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. If irritation develops, get medical aid.
Skin:	Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.
Ingestion:	Do not induce vomiting. Get medical aid immediately. Call a poison control center.
Inhalation:	Remove from exposure and move to fresh air immediately. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear. Do not use mouth-to-mouth resuscitation if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.
Notes to Physician:	Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information:	As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.
Extinguishing Media:	Substance is noncombustible; use agent most appropriate to extinguish surrounding fire.
Autoignition Temperature:	Not applicable.
Flash Point:	Not applicable.
Explosion Limits: Lower:	Not available
Explosion Limits: Upper:	Not available
NFPA Rating:	health: 2; flammability: 0; instability: 2;

Section 6 - Accidental Release Measures

General Information:	Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks:	Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation. Do not let this chemical enter the environment.

Section 7 - Handling and Storage

Handling:	Use with adequate ventilation. Minimize dust generation and accumulation. Do not get in eyes, on skin, or on clothing. Do not ingest or inhale.
Storage:	Store in a cool, dry place. Store in a tightly closed container. Keep away from strong acids. Do not store in aluminum containers.

Section 8 - Exposure Controls, Personal Protection

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Sodium bisulfite	5 mg/m3	5 mg/m3 TWA	none listed

OSHA Vacated PELs: Sodium bisulfite: 5 mg/m3 TWA

Engineering Controls:

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

Exposure Limits

Personal Protective Equipment

Eyes:	Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.
Skin:	Wear appropriate protective gloves to prevent skin exposure.
Clothing:	Wear appropriate protective clothing to prevent skin exposure.
Respirators:	Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State:	Crystalline powder
Color:	white
Odor:	sulfurous odor
pH:	4 - 5 (25% aq. sol.)
Vapor Pressure:	Not applicable.
Vapor Density:	Not available
Evaporation Rate:	Not applicable.
Viscosity:	Not applicable.
Boiling Point:	Not applicable.
Freezing/Melting Point:	150 deg C (decom)
Decomposition Temperature:	Not available
Solubility in water:	300 g/L
Specific Gravity/Density:	1.480
Molecular Formula:	HNaO3S
Molecular Weight:	104.06

Section 10 - Stability and Reactivity

Chemical Stability:	Oxidizes when exposed to air. Contact with acid liberates gas. Moisture sensitive.
Conditions to Avoid:	Incompatible materials, dust generation, exposure to air, temperatures above 150ï¿½C, exposure to moist air or water.
Incompatibilities with Other Materials	Oxidizing agents, acids, aluminum.
Hazardous Decomposition Products	Oxides of sulfur, toxic fumes of sodium oxide.
Hazardous Polymerization	Will not occur.

Section 11 - Toxicological Information

RTECS#: CAS# 7631-90-5: VZ2000000

RTECS:
CAS# 7631-90-5: Oral, rat: LD50 = 2 gm/kg;

LD50/LC50:	. Other:
Carcinogenicity:	Sodium bisulfite - IARC: Group 3 (not classifiable)
Epidemiology:	Two cases of occupational asthma in laundry workers exposed to sodium metabisulfite were reported. Sodium metabisulfite may be considered to be the anhydride of sodium bisulfite and is the chief constituent of commercial dry sodium bisulfite.
Teratogenicity:	No information found
Reproductive:	See actual entry in RTECS for complete information.
Neurotoxicity:	No information found
Mutagenicity:	See actual entry in RTECS for complete information.
Other:	See actual entry in RTECS for complete information.

Section 12 - Ecological Information

Other: Do not empty into drains.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification. RCRA P-Series: None listed. RCRA U-Series: None listed.

Section 14 - Transport Information

US DOT
Shipping Name: CORROSIVE SOLID, ACIDIC, INORGANIC, N.O.S.
Hazard Class: 8
UN Number: UN3260
Packing Group: III
Canada TDG
Shipping Name: CORROSIVE SOLID, ACIDIC, INORGANIC, N.O. (SODIUM BISULFITE)
Hazard Class: 8
UN Number: UN3260
Packing Group: III

USA RQ: CAS# 7631-90-5: 5000 lb final RQ; 2270 kg final RQ

Section 15 - Regulatory Information

US Federal

TSCA

CAS# 7631-90-5 is listed on the TSCA Inventory.

Health & Safety Reporting List	None of the chemicals are on the Health & Safety Reporting List.
Chemical Test Rules	None of the chemicals in this product are under a Chemical Test Rule.
Section 12b	None of the chemicals are listed under TSCA Section 12b.
TSCA Significant New Use Rule	None of the chemicals in this material have a SNUR under TSCA.
CERCLA Hazardous	

Substances and corresponding RQs	CAS# 7631-90-5: 5000 lb final RQ; 2270 kg final RQ
SARA Section 302 Extremely Hazardous Substances	None of the chemicals in this product have a TPQ.
SARA Codes	CAS # 7631-90-5: acute.
Section 313	No chemicals are reportable under Section 313.
Clean Air Act:	This material does not contain any hazardous air pollutants. This material does not contain any Class 1 Ozone depletors. This material does not contain any Class 2 Ozone depletors.
Clean Water Act:	CAS# 7631-90-5 is listed as a Hazardous Substance under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.
OSHA:	
STATE	Sodium bisulfite can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.
California Prop 65	
California No Significant Risk Level:	None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols: XN

Risk Phrases:

R 22 Harmful if swallowed.

R 31 Contact with acids liberates toxic gas.

Safety Phrases:

S 25 Avoid contact with eyes.

S 46 If swallowed, seek medical advice immediately and show this container or label.

WGK (Water Danger/Protection)

CAS# 7631-90-5: 1

Canada

CAS# 7631-90-5 is listed on Canada's DSL List

Canadian WHMIS Classifications: D1B

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

CAS# 7631-90-5 is listed on Canada's Ingredient Disclosure List

Section 16 - Other Information

MSDS Creation Date: 9/02/1997

Revision #10 Date 7/20/2009

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

World Headquarters
Hach Company
P.O.Box 389
Loveland, CO USA 80539
(970) 669-3050

Date Printed 9/22/05
MSDS No: M00205

MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: Sodium Hydroxide Pellets
Catalog Number: 18734

Hach Company
P.O.Box 389
Loveland, CO USA 80539
(970) 669-3050

Emergency Telephone Numbers:
(Medical and Transportation)
(303) 623-5716 24 Hour Service
(515)232-2533 8am - 4pm CST

MSDS Number: M00205
Chemical Name: Sodium Hydroxide
CAS No.: 1310-73-2
Chemical Formula: NaOH
Chemical Family: Inorganic Base
PIN: 1823
Intended Use: Laboratory reagent
Date of MSDS Preparation:
Day: 22
Month: 09
Year: 2005
MSDS Prepared: MSDS prepared by Product Compliance Department extension 3350

2. COMPOSITION / INFORMATION ON INGREDIENTS

Sodium Hydroxide
Percent Range: 100.0
Percent Range Units: weight / weight
CAS No.: 1310-73-2
LD50: Oral rat LDLo = 500 mg/kg.
LC50: None reported
TLV: 2 mg/m³
PEL: 2 mg/m³
Ingredient WHMIS Symbol: Corrosive

3. HAZARDS IDENTIFICATION

Emergency Overview:
Appearance: White pellets
Physical State: Solid
Odor: Pungent
CAUSES SEVERE BURNS HARMFUL IF SWALLOWED

HMIS:
Health: 3
Flammability: 0
Reactivity: 1
Protective Equipment: X - See protective equipment, Section 8.
Potential Health Effects:
Eye Contact: Causes severe burns

Skin Contact: Causes severe burns
Skin Absorption: None Reported
Target Organs: None Reported
Ingestion: Toxic Causes: severe burns rapid pulse and respirations vomiting shock collapse death
Target Organs: None reported
Inhalation: Causes: severe burns
Target Organs: None reported
Medical Conditions Aggravated: Pre-existing: Eye conditions Skin conditions Respiratory conditions
Chronic Effects: None reported
Cancer / Reproductive Toxicity Information:
IARC Listed: No

NTP Listed: No

Additional Cancer / Reproductive Toxicity Information: None reported
Toxicologically Synergistic Products: None reported
WHMIS Hazard Classification: Class D, Division 1, Subdivision B - Toxic material (immediate effects) Class E - Corrosive material
WHMIS Symbols: Acute Poison Corrosive

4. FIRST AID

Eye Contact: Immediately flush eyes with water for 15 minutes. Call physician.
Skin Contact (First Aid): Wash skin with plenty of water for 15 minutes. Remove contaminated clothing. Call physician immediately.
Ingestion (First Aid): Do not induce vomiting. Give 1-2 glasses of water. Never give anything by mouth to an unconscious person. Call physician immediately.
Inhalation: Remove to fresh air. Give artificial respiration if necessary. Call physician.

5. FIRE FIGHTING MEASURES

Flammable Properties: Not Flammable, but reacts with most metals to form flammable hydrogen gas. During a fire, corrosive and toxic gases may be generated by thermal decomposition.
Flash Point: Not applicable
Method: Not applicable
Flammability Limits:
Lower Explosion Limits: Not applicable
Upper Explosion Limits: Not applicable
Autoignition Temperature: Not applicable
Hazardous Combustion Products: Toxic fumes of: sodium monoxide
Fire / Explosion Hazards: May react violently with: flammable liquids strong acids water
Static Discharge: None reported.
Mechanical Impact: None reported
Extinguishing Media: Use media appropriate to surrounding fire conditions
Fire Fighting Instruction: As in any fire, wear self-contained breathing apparatus pressure-demand and full protective gear. Evacuate area and fight fire from a safe distance.

6. ACCIDENTAL RELEASE MEASURES

Spill Response Notice:
Only persons properly qualified to respond to an emergency involving hazardous substances should respond to a spill involving chemicals. See Section 13, Special Instructions for disposal assistance.
Containment Technique: Stop spilled material from being released to the environment.
Clean-up Technique: Avoid contact with spilled material. Sweep up material. Dispose of material in an E.P.A. approved hazardous waste facility. Decontaminate the area of the spill with a weak acid solution.
Evacuation Procedure: Evacuate general area (50 foot radius or as directed by your facility's emergency response plan) when: any quantity is spilled. If conditions warrant, increase the size of the evacuation.
D.O.T. Emergency Response Guide Number: 154

7. HANDLING / STORAGE

Handling: Avoid contact with eyes skin clothing Do not breathe dust. Wash thoroughly after handling. Use with adequate ventilation. Maintain general industrial hygiene practices when using this product.
Storage: Keep container tightly closed when not in use. Keep away from: acids flammable liquids metals

8. EXPOSURE CONTROLS / PROTECTIVE EQUIPMENT

Engineering Controls: Have an eyewash station nearby. Have a safety shower nearby. Maintain adequate ventilation to keep vapor level below TWA for chemicals in this product. Maintain general industrial hygiene practices when using this product.
Personal Protective Equipment:
Eye Protection: safety glasses with top and side shields
Skin Protection: disposable latex gloves lab coat
Inhalation Protection: adequate ventilation and / or dust / mist mask
Precautionary Measures: Avoid contact with: eyes skin clothing Do not breathe: dust Wash thoroughly after handling. Use with adequate ventilation. Keep away from: acids/acid fumes metals
TLV: 2 mg/m³
PEL: 2 mg/m³

9. PHYSICAL / CHEMICAL PROPERTIES

Appearance: White pellets
Physical State: Solid
Molecular Weight: 40.0 g/mol
Odor: Pungent
pH: 14 (5% solution)
Vapor Pressure: 1 mm at 739°C (1362°F)
Vapor Density (air = 1): 2.12
Boiling Point: Not applicable
Melting Point: 318.4°C (605.1°F)
Specific Gravity (water = 1): 2.13
Evaporation Rate (water = 1): Not applicable
Volatile Organic Compounds Content: Not applicable
Coefficient of Water / Oil: Not determined
Solubility:
Water: 42 g/ 100 g water @ 0°C (32°F)
Acid: Soluble, may react violently.
Other: Soluble in methanol, glycerol, absolute alcohol
Metal Corrosivity:
Steel: Not determined
Aluminum: Not determined

10. STABILITY / REACTIVITY

Chemical Stability: Stable when stored under proper conditions.
Conditions to Avoid: Extreme temperatures Excess moisture
Reactivity / Incompatibility: May react violently in contact with: acids aluminum flammable liquids halogenated organic compounds nitro compounds tin water (moisture) zinc
Hazardous Decomposition: Contact with metals may release flammable hydrogen gas.
Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Product Toxicological Data:
LD50: Oral rat LDLo = 500 mg/kg.

LC50: None reported
Dermal Toxicity Data: None reported
Skin and Eye Irritation Data: Skin rabbit 500 mg/24 hour SEVERE; Eye rabbit 50 µg/24 hour SEVERE; Eye rabbit 1 mg/24 hours SEVERE; Eye rabbit 100 mg rinse SEVERE; Eye rabbit 1% SEVERE; Eye rabbit 400 µg MILD
Mutation Data: None reported
Reproductive Effects Data: None reported
--
Ingredient Toxicological Data: --
Not applicable

12. ECOLOGICAL INFORMATION

Product Ecological Information: --
No ecological data available for this product.
Ingredient Ecological Information: --
Not applicable

13. DISPOSAL CONSIDERATIONS

Special Instructions (Disposal): Work in an approved fume hood. Dilute material with excess water making a weaker than 5% solution. Adjust to a pH between 6 and 9 with an acid, such as sulfuric or citric. Open cold water tap completely, slowly pour the reacted material to the drain. Allow cold water to run for 5 minutes to completely flush the system.
Empty Containers: Rinse three times with an appropriate solvent. Dispose of empty container as normal trash.
NOTICE (Disposal): These disposal guidelines are based on federal regulations and may be superseded by more stringent state or local requirements. Please consult your local environmental regulators for more information.

14. TRANSPORT INFORMATION

T.D.G.:
Proper Shipping Name: Sodium Hydroxide, Solid
--
Hazard Class: 8
PIN: 1823
Group: II
Subsidiary Risk: NA
Additional Information: This product may be shipped as part of a chemical kit composed of various compatible dangerous goods for analytical or testing purposes. This kit would have the following classification: Proper Shipping Name: Chemical Kit Hazard Class: 9 UN Number 3316

15. REGULATORY INFORMATION

National Inventories:
Canadian Inventory Status: DSL Listed: Yes
This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all of the information required by the CPR.

16. OTHER INFORMATION

References: CCINFO RTECS. Canadian Centre for Occupational Health and Safety. Hamilton, Ontario Canada: 30 June 1993. List of Dangerous Substances Classified in Annex I of the EEC Directive (67/548) - Classification, Packaging and Labeling of Dangerous Substances, Amended July 1992. Gosselin, R. E. et al. Clinical Toxicology of Commercial Products, 5th Ed. Baltimore: The Williams and Wilkins Co., 1984. Fire Protection Guide on Hazardous Materials, 10th Ed. Quincy, MA: National Fire Protection Fire Protection Guide on Hazardous Materials, 10th Ed. Quincy, MA: National Fire Protection Association, 1991. Technical Judgment. NIOSH/OSHA Occupational Health Guidelines for Chemical Hazards. Cincinnati: Department of Health and Human Services, 1981. The Merck Index, 11th Ed. Rahway, New Jersey: Merck and Co., Inc., 1989. Sax, N. Irving. Dangerous Properties of Industrial Materials, 7th Ed. New York: Van Nostrand Reinhold Co., 1989. Air Contaminants, Federal Register, Vol. 54, No. 12. Thursday, January 19, 1989. pp.

2332-2983. TLV's Threshold Limit Values and Biological Exposure Indices for 1992-1993. American Conference of Governmental Industrial Hygienists, 1992. 29 CFR 1900 - 1910 (Code of Federal Regulations - Labor). IARC Monographs on the Evaluation of the Carcinogenic Risks to Humans. World Health Organization (Volumes 1-42) Supplement 7. France: 1987. Sixth Annual Report on Carcinogens, 1991. U.S. Department of Health and Human Services. Rockville, MD: Technical Resources, Inc. 1991. Vendor Information.

Legend:

NA - Not Applicable	w/w - weight/weight
ND - Not Determined	w/v - weight/volume
NV - Not Available	v/v - volume/volume

USER RESPONSIBILITY: Each user should read and understand this information and incorporate it in individual site safety programs in accordance with applicable hazard communication standards and regulations.

THE INFORMATION CONTAINED HEREIN IS BASED ON DATA CONSIDERED TO BE ACCURATE. HOWEVER, NO WARRANTY IS EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF.

Alfa Aesar/Avocado Organics - Material Safety Data Sheet A15480

1. IDENTIFICATION OF SUBSTANCE AND SUPPLIER

Name On Label : Sodium iodide
Product Number : A15480
Supplier :
Johnson Matthey Catalog Company Inc.
30 Bond Street, Ward Hill, Massachusetts, 01835-8099
Emergency Telephone Number: (978) 521-6300; CHEMTREC: (800) 424-9300
Alternative Names : None in common use.

2. COMPOSITION AND INFORMATION ON COMPONENTS

Name : Sodium iodide
MinorImpurities : Not determined
CAS Number : 7681-82-5
EINECS Number : 2316793
EEC Number :

3. HAZARDS IDENTIFICATION

Designation :
HARMFUL ~ IRRITANT
Risk Phrases
R20/21/22 Harmful by inhalation, in contact with skin and if swallowed.
R36/37/38 Irritating to eyes, respiratory system and skin.

4. FIRST AID MEASURES

Inhalation
Remove to fresh air. If breathing is difficult give oxygen and seek medical attention.

Eye Contact
Flush with copious amounts of water for at least 15 minutes. If irritation persists, seek medical attention.

Skin Contact
Remove contaminated clothing. Wash affected area with soap and water. Rinse thoroughly. If irritation persists or other symptoms are observed, seek medical advice.

Ingestion
Rinse out mouth and drink lots of water. In case of irritation or other symptoms, seek medical attention.

5. FIRE FIGHTING MEASURES

Extiguishing Medium
Use fire fighting measures which suit the environment and take into account other materials which may be involved. In general, water-based extinguishers should not be used for fires involving organic materials. Use carbon dioxide or dry powder.

Protective Equipment
Wear self-contained breathing apparatus and protective clothing.

Hazardous Products of Combustion May Include:
hydrogen iodide (hydriodic acid).

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6. ACCIDENTAL RELEASE MEASURES

Personal Protection
Avoid inhalation or contact of spilled material with skin or clothing. Wear protective equipment including rubber gloves, and eye protection. Keep unprotected persons away.

Environmental Protection
Take precautions to ensure product does not contaminate the ground or enter the drainage system.

Collection
Mix with vermiculite or proprietary absorbent material and transfer to sealed containers for disposal.

---

7. HANDLING AND STORAGE

Handling
Chemicals should be used only by those trained in handling potentially hazardous materials. Rubber gloves, eye protection and protective clothing should be worn. Operations should be carried out in an efficient fume hood or equivalent system.

Storage
Store in tightly sealed containers in a cool place.
Product reacts with water. Take precautions to avoid contact with atmospheric moisture.
Material is sensitive to light.

---

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Respiratory
Avoid inhalation of product. Handle in an efficient fume hood or equivalent system.

Eye
Avoid eye contact. Wear safety spectacles, goggles or, for larger quantities, a full face mask.

Hands and Body
Irritant product. Avoid skin contact. Wear rubber gloves, protective clothing and, for larger quantities,

full arm, body and face protection. Wash hands thoroughly after handling.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : White crystals
Physical Constants: Not available
Molecular Formula : INa
Formula Weight : 149.89
Water Solubility : V sol
Density : 3.67
Flash Point : Not available

10. STABILITY AND REACTIVITY

Specific Hazard
Incompatibilities
Strong acids.

Decomposition
Hazardous products of decomposition may include:
hydrogen iodide (hydriodic acid).

11. TOXICOLOGICAL INFORMATION

RTECS Number : WB6475000
Acute Toxicity
LD50 : ORL-RAT 4340mg/kg

Harmful by inhalation, in contact with skin and if swallowed. Irritating to eyes, respiratory system and skin.

Chronic Toxicity
Possible teratogen. May cause damage to the thyroid.

12. ECOLOGICAL EFFECTS

General
Take care to prevent chemicals from entering the ground, water courses or drainage systems.

13. DISPOSAL CONSIDERATIONS

Disposal
Disposal should be via an approved contractor and should take full account of local regulations.

14. TRANSPORT INFORMATION

UN Number : 3288
Land Transport
ADR/RIC Code/Class: 6.1 /Packing Group III
Maritime Transport IMDG Code/Class : 6.1 /Packing Group III
Air Transport IATA Code/Class : 6.1 /Packing Group III

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15. REGULATORY INFORMATION

CAS Number : 7681-82-5
EINECS Number : 2316793
EEC Number :
UN Number : 3288
RTECS Number : WB6475000
Hazard Indication :
HARMFUL ~ IRRITANT

Risk and Safety Phrases
Harmful by inhalation, in contact with skin and if swallowed.
Irritating to eyes, respiratory system and skin.
In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
Wear suitable gloves and eye/face protection.

TSCA: Listed substance.

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16. OTHER INFORMATION

It must be recognised that the physical and chemical properties of any product may not be fully understood and that new, possibly hazardous products may arise from reactions between chemicals. The information given in this data sheet is based on our present knowledge and shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

Date of Last Review: 3rd August 1998
Date Printed : 18th September 1998

Material Safety Data Sheet

acc. to OSHA and ANSI

Printing date 06/14/2004 Reviewed on 05/21/2004

1 Identification of substance:

- **Product details:**
- **Product name:** **Sodium sulfite**
- **Stock number:** 13454
- **Manufacturer/Supplier:**
  Alfa Aesar, A Johnson Matthey Company
  Johnson Matthey Catalog Company, Inc.
  30 Bond Street
  Ward Hill, MA 01835-8099
  Emergency Phone: (978) 521-6300
  CHEMTREC: (800) 424-9300
  Web Site: www.alfa.com
- **Information Department:** Health, Safety and Environmental Department
- **Emergency information:**
  During normal hours the Health, Safety and Environmental Department. After normal hours call Chemtrec at (800) 424-9300.

2 Composition/Data on components:

- **Chemical characterization:**
  Description: (CAS#)
  Sodium sulfite (CAS# 7757-83-7), 100%
- **Identification number(s):**
- **EINECS Number:** 231-821-4

3 Hazards identification

- **Hazard description:** Xn Harmful
- **Information pertaining to particular dangers for man and environment**
  R 22 Harmful if swallowed.
  R 36/38 Irritating to eyes and skin.
  R 40 Limited evidence of a carcinogenic effect.
- **Classification system**
- **HMIS ratings (scale 0-4)**

  (Hazardous Materials Identification System)
  Health (acute effects) = 1

Flammability = 0
Reactivity = 0

- **4 First aid measures**

  - **After inhalation**
    Supply fresh air. If required, provide artificial respiration.
    Keep patient warm.
    Seek immediate medical advice.
  - **After skin contact**
    Immediately wash with water and soap and rinse thoroughly.
    Seek immediate medical advice.
  - **After eye contact**
    Rinse opened eye for several minutes under running water. Then consult a doctor.
  - **After swallowing** Seek immediate medical advice.
  - **Information for doctor**
  - **The following symptoms may occur:**
    Gastric or intestinal disorders.
    Nausea
    Unconsciousness

- **5 Fire fighting measures**

  - **Suitable extinguishing agents**
    Product is not flammable. Use fire fighting measures that suit the surrounding fire.
  - **Special hazards caused by the material, its products of combustion or resulting gases:**
    In case of fire, the following can be released:
    Sulfur dioxide (SO2)
  - **Protective equipment:**
    Wear self-contained respirator.
    Wear fully protective impervious suit.

- **6 Accidental release measures**

  - **Person-related safety precautions:**
    Wear protective equipment. Keep unprotected persons away.
    Ensure adequate ventilation
  - **Measures for environmental protection:**
    Do not allow material to be released to the environment without proper governmental permits.
  - **Measures for cleaning/collecting:**
    Dispose contaminated material as waste according to item 13.
  - **Additional information:**
    See Section 7 for information on safe handling
    See Section 8 for information on personal protection equipment.
    See Section 13 for disposal information.

- **7 Handling and storage**

- **Handling**
- **Information for safe handling:**
  Keep container tightly sealed.
  Store in cool, dry place in tightly closed containers.
  Ensure good ventilation at the workplace.
  Prevent formation of dust.
- **Information about protection against explosions and fires:**
  The product is not flammable

- **Storage**
- **Requirements to be met by storerooms and receptacles:**
  No special requirements.
- **Information about storage in one common storage facility:**
  Do not store together with oxidizing and acidic materials.
- **Further information about storage conditions:**
  Keep container tightly sealed.
  Store in cool, dry conditions in well sealed containers.

- **8 Exposure controls and personal protection**

- **Additional information about design of technical systems:**
  Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute.

  Components with limit values that require monitoring at the workplace:
  Not required.
- **Additional information:** No data

- **Personal protective equipment**
- **General protective and hygienic measures**
  The usual precautionary measures for handling chemicals should be followed.
  Keep away from foodstuffs, beverages and feed.
  Remove all soiled and contaminated clothing immediately.
  Wash hands before breaks and at the end of work.
  Avoid contact with the eyes and skin.
- **Breathing equipment:**
  Use suitable respirator when high concentrations are present.
- **Protection of hands:** Impervious gloves
- **Eye protection:** Safety glasses
- **Body protection:** Protective work clothing.

- **9 Physical and chemical properties:**

- **General Information**

- **Form:** Granules

- **Color:** White
- **Odor:** Odorless

	Value/Range	Unit	Method
Change in condition			
Melting point/Melting range:	Not determined		
Boiling point/Boiling range:	Not determined		
Sublimation temperature / start:	Not determined		
Flash point:	Not applicable		
Flammability (solid, gaseous)	Product is not flammable.		
Ignition temperature:	Not determined		
Decomposition temperature:	Not determined		

- **Danger of explosion:**
  Product does not present an explosion hazard.

Explosion limits:			
Lower:	Not determined		
Upper:	Not determined		
Vapor pressure:	Not determined		
Density:	at 20 ° C	2.633 g/cm³	
Solubility in / Miscibility with			
Water:	at 0 ° C	125.4 g/l	

10 Stability and reactivity

- **Thermal decomposition / conditions to be avoided:**
  Decomposition will not occur if used and stored according to specifications.
- **Materials to be avoided:**
  Acids
  Oxidizing agents
- **Dangerous reactions** No dangerous reactions known
- **Dangerous products of decomposition:**
  Sulfur dioxide
  Metal oxide fume

11 Toxicological information

- **Acute toxicity:**
  LD/LC50 values that are relevant for classification:

  Oral: LD50: 820 mg/kg (mus)
- **Primary irritant effect:**

- **on the skin:** Irritant to skin and mucous membranes.
- **on the eye:** Irritating effect.
- **Sensitization:**
  Sensitization possible through inhalation.
  Sensitization possible through skin contact.
- **Other information (about experimental toxicology):**
  Mutagenic effects have been observed on tests with laboratory animals.
  Mutagenic effects have been observed on tests with bacteria.
- **Subacute to chronic toxicity:**
  Large oral doses may cause violent colic andf diarrhea, CNS depression and even death. Persons with allergies and/or asthma may exhibit hypersensitivity to sulfites.
- **Additional toxicological information:**
  To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.
  IARC-3: Not classifiable as to carcinogenicity to humans.

12 Ecological information:

- **General notes:**
  Do not allow material to be released to the environment without proper governmental permits.

13 Disposal considerations

- **Product:**
- **Recommendation**
  Consult state, local or national regulations to ensure proper disposal.

- **Uncleaned packagings:**
- **Recommendation:**
  Disposal must be made according to official regulations.

14 Transport information

Not a hazardous material for transportation.

- **DOT regulations:**
- **Hazard class:** None

- **Land transport ADR/RID (cross-border)**
- **ADR/RID class:** None

- **Maritime transport IMDG:**
- **IMDG Class:** None

- **Air transport ICAO-TI and IATA-DGR:**
- **ICAO/IATA Class:** None

- **Transport/Additional information:**
  Not dangerous according to the above specifications.

- **15 Regulations**

- **Product related hazard informations:**

- **Hazard symbols:** Xn Harmful

- **Risk phrases:**
  22 Harmful if swallowed.
  36/38 Irritating to eyes and skin.
  40 Limited evidence of a carcinogenic effect.

- **Safety phrases:**
  22 Do not breathe dust.
  26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
  36 Wear suitable protective clothing.

- **National regulations**
  All components of this product are listed in the U.S. Environmental Protection Agency Toxic Substances Control Act Chemical substance Inventory.

- **Information about limitation of use:**
  For use only by technically qualified individuals.

- **16 Other information:**

  Employers should use this information only as a supplement to other information gathered by them, and should make independent judgement of suitability of this information to ensure proper use and protect the health and safety of employees. This information is furnished without warranty, and any use of the product not in conformance with this Material Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.

- **Department issuing MSDS:** Health, Safety and Environmental Department.
- **Contact:** Darrell R. Sanders

Material Safety Data Sheet

acc. to OSHA and ANSI

Printing date 06/14/2004 Reviewed on 05/20/2004

1 Identification of substance:

- **Product details:**
- **Product name: Sodium thiosulfate**
- **Stock number:** 14518
- **Manufacturer/Supplier:**
  Alfa Aesar, A Johnson Matthey Company
  Johnson Matthey Catalog Company, Inc.
  30 Bond Street
  Ward Hill, MA 01835-8099
  Emergency Phone: (978) 521-6300
  CHEMTREC: (800) 424-9300
  Web Site: www.alfa.com
- **Information Department:** Health, Safety and Environmental Department
- **Emergency information:**
  During normal hours the Health, Safety and Environmental Department. After normal hours call Chemtrec at (800) 424-9300.

2 Composition/Data on components:

- **Chemical characterization:**
  Description: (CAS#)
  Sodium thiosulfate, pentahydrate (CAS# 10102-17-7), 100%
- **Identification number(s):**
- **EINECS Number:** 231-867-5

3 Hazards identification

- **Hazard description:** · Not applicable
- **Information pertaining to particular dangers for man and environment**
  Not applicable
- **Classification system**
- **HMIS ratings (scale 0-4)**

  (Hazardous Materials Identification System)
  Health (acute effects) = 1
  Flammability = 0
  Reactivity = 1

4 First aid measures

- **After inhalation**
  Supply fresh air. If required, provide artificial respiration.
  Keep patient warm.
  Seek immediate medical advice.
- **After skin contact**
  Immediately wash with water and soap and rinse thoroughly.
  Seek immediate medical advice.
- **After eye contact**
  Rinse opened eye for several minutes under running water. Then consult a doctor.
- **After swallowing** Seek medical treatment.

5 Fire fighting measures

- **Suitable extinguishing agents**
  Product is not flammable. Use fire fighting measures that suit the surrounding fire.
- **Special hazards caused by the material, its products of combustion or resulting gases:**
  In case of fire, the following can be released:
  Sulfur dioxide (SO2)
  Metal oxide
- **Protective equipment:**
  Wear self-contained respirator.
  Wear fully protective impervious suit.

6 Accidental release measures

- **Person-related safety precautions:**
  Wear protective equipment. Keep unprotected persons away.
  Ensure adequate ventilation
- **Measures for environmental protection:**
  Do not allow material to be released to the environment without proper governmental permits.
- **Measures for cleaning/collecting:** Pick up mechanically.
- **Additional information:**
  See Section 7 for information on safe handling
  See Section 8 for information on personal protection equipment.
  See Section 13 for disposal information.

7 Handling and storage

- **Handling**
- **Information for safe handling:**
  Keep container tightly sealed.
  Store in cool, dry place in tightly closed containers.
  No special precautions are necessary if used correctly.

- **Information about protection against explosions and fires:**
  The product is not flammable

- **Storage**
- **Requirements to be met by storerooms and receptacles:**
  No special requirements.
- **Information about storage in one common storage facility:**
  Do not store together with oxidizing and acidic materials.
- **Further information about storage conditions:**
  Keep container tightly sealed.
  Store in cool, dry conditions in well sealed containers.

8 Exposure controls and personal protection

- **Additional information about design of technical systems:**
  Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute.

  Components with limit values that require monitoring at the workplace:
  Not required.
- **Additional information:** No data

- **Personal protective equipment**
- **General protective and hygienic measures**
  The usual precautionary measures for handling chemicals should be followed.
  Keep away from foodstuffs, beverages and feed.
  Remove all soiled and contaminated clothing immediately.
  Wash hands before breaks and at the end of work.
- **Breathing equipment:**
  Use suitable respirator when high concentrations are present.
- **Protection of hands:** Impervious gloves
- **Eye protection:** Safety glasses
- **Body protection:** Protective work clothing.

9 Physical and chemical properties:

- **General Information**

- **Form:** Crystalline
- **Color:** Colorless
- **Odor:** Odorless

	Value/Range	Unit	Method
Change in condition			
Melting point/Melting range:	48	° C	
Boiling point/Boiling range:	100	° C	(-H2O)
Sublimation temperature / start:	Not determined		

- **Flash point:** Not applicable
- **Flammability (solid, gaseous)** Product is not flammable.
- **Ignition temperature:** Not determined
- **Decomposition temperature:** Not determined
- **Danger of explosion:**
  Product does not present an explosion hazard.
- **Explosion limits:**
- **Lower:** Not determined
- **Upper:** Not determined
- **Vapor pressure:** Not determined
- **Density:** at 20 ° C 1.75 g/cm³
- **Solubility in / Miscibility with**
- **Water:** at 4 ° C 790 g/l

10 Stability and reactivity

- **Thermal decomposition / conditions to be avoided:**
  Decomposition will not occur if used and stored according to specifications.
- **Materials to be avoided:**
  Acids
  Oxidizing agents
  Halogens
- **Dangerous reactions**
  Reacts with oxidizing agents
  Reacts with acids releasing sulfur dioxide
- **Dangerous products of decomposition:**
  Sulfur dioxide
  Metal oxide fume

11 Toxicological information

- **Acute toxicity:**
- **Primary irritant effect:**
- **on the skin:** Powder: irritant effect
- **on the eye:** Powder: irritant effect
- **Sensitization:** No sensitizing effects known.
- **Subacute to chronic toxicity:**
  Ingestion causes cyanosis in humans. Large oral doses have a cathartic effect.
- **Additional toxicological information:**
  To the best of our knowledge the acute and chronic toxicity of

this substance is not fully known.
No classification data on carcinogenic properties of this material is available from the EPA, IARC, NTP, OSHA or ACGIH.

- **12 Ecological information:**

  - **General notes:**
    Do not allow material to be released to the environment without proper governmental permits.

- **13 Disposal considerations**

  - **Product:**
  - **Recommendation**
    Consult state, local or national regulations to ensure proper disposal.

  - **Uncleaned packagings:**
  - **Recommendation:**
    Disposal must be made according to official regulations.

- **14 Transport information**

  Not a hazardous material for transportation.

  - **DOT regulations:**
  - **Hazard class:** None

  - **Land transport ADR/RID (cross-border)**
  - **ADR/RID class:** None

  - **Maritime transport IMDG:**
  - **IMDG Class:** None

  - **Air transport ICAO-TI and IATA-DGR:**
  - **ICAO/IATA Class:** None

  - **Transport/Additional information:**
    Not dangerous according to the above specifications.

- **15 Regulations**

  - **Product related hazard informations:**
    Observe the general safety regulations when handling chemicals

  - **National regulations**
    All components of this product are listed in the U.S. Environmental Protection Agency Toxic Substances Control Act Chemical substance Inventory.

- **Information about limitation of use:**
  For use only by technically qualified individuals.

- **16 Other information:**

  Employers should use this information only as a supplement to other information gathered by them, and should make independent judgement of suitability of this information to ensure proper use and protect the health and safety of employees. This information is furnished without warranty, and any use of the product not in conformance with this Material Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.

  - **Department issuing MSDS:** Health, Safety and Environmental Department.
  - **Contact:** Darrell R. Sanders

SIGMA-ALDRICH

MATERIAL SAFETY DATA SHEET

Date Printed: 09-21-2009
Date Updated: 01/26/2006
Version 2.4

Section 1 - Product and Company Information

Product Name	SULFURIC ACID 5 MOL/L VOLUMETRIC SOLUTI&
Product Number	35347
Brand	FLUKA
Company	Sigma-Aldrich
Address	3050 Spruce Street SAINT LOUIS, MO 63103 USA
Technical Phone:	+1 800-325-5832
Fax:	+1 800-325-5052
Emergency Phone:	(314) 776-6555

Section 2 - Composition/Information on Ingredient

Substance Name	CAS #	SARA 313
SULFURIC ACID SOLUTION 15-51%	7664-93-9	No

Ingredient Name	CAS #	Percent	SARA 313
WATER	7732-18-5	>= 49 < 85	No
SULFURIC ACID, >= 51%	7664-93-9	>= 15 <= 51	No

Formula H2SO4

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Corrosive.
Causes severe burns.
Target organ(s): Teeth. Cardiovascular system.

HMIS RATING

HEALTH: 3*
FLAMMABILITY: 0
REACTIVITY: 2

NFPA RATING

HEALTH: 3
FLAMMABILITY: 0
REACTIVITY: 2

*additional chronic hazards present.

For additional information on toxicity, please refer to Section 11.

Section 4 - First Aid Measures

ORAL EXPOSURE

If swallowed, wash out mouth with water provided person is conscious. Call a physician immediately. Do not induce vomiting.

INHALATION EXPOSURE
If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen.

DERMAL EXPOSURE
In case of skin contact, flush with copious amounts of water for at least 15 minutes. Remove contaminated clothing and shoes. Call a physician.

EYE EXPOSURE
In case of contact with eyes, flush with copious amounts of water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Call a physician.

Section 5 - Fire Fighting Measures

CONDITIONS OF FLAMMABILITY
Strong dehydrating agent which may cause ignition of finely divided materials on contact.

FLASH POINT
N/A

AUTOIGNITION TEMP
N/A

FLAMMABILITY
N/A

EXTINGUISHING MEDIA
Suitable: Carbon dioxide, dry chemical powder, or appropriate foam.
Unsuitable: Do not use water.

FIREFIGHTING
Protective Equipment: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.
Specific Hazard(s): Emits toxic fumes under fire conditions. Water reactive material.

Section 6 - Accidental Release Measures

PROCEDURE TO BE FOLLOWED IN CASE OF LEAK OR SPILL
Evacuate area.

PROCEDURE(S) OF PERSONAL PRECAUTION(S)
Wear self-contained breathing apparatus, rubber boots, and heavy rubber gloves.

METHODS FOR CLEANING UP
Ventilate area and wash spill site after material pickup is complete. Absorb on sand or vermiculite and place in closed containers for disposal.

Section 7 - Handling and Storage

HANDLING
User Exposure: Do not breathe vapor. Do not get in eyes, on skin, on clothing. Avoid prolonged or repeated exposure.

STORAGE
Suitable: Keep tightly closed.
Incompatible Materials: Do not allow contact with water

Section 8 - Exposure Controls / PPE

ENGINEERING CONTROLS

Safety shower and eye bath. Use only in a chemical fume hood.

PERSONAL PROTECTIVE EQUIPMENT

Respiratory: Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU). Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator.
Hand: Compatible chemical-resistant gloves.
Eye: Chemical safety goggles.
Other: Faceshield (8-inch minimum).

GENERAL HYGIENE MEASURES

Wash contaminated clothing before reuse. Discard contaminated shoes. Wash thoroughly after handling.

Section 9 - Physical/Chemical Properties

Appearance	Physical State: Clear liquid Color: Colorless	
Property	Value	At Temperature or Pressure
Molecular Weight	98.08 AMU	
pH	N/A	
BP/BP Range	110.0 - 120.0 °C	760 mmHg
MP/MP Range	N/A	
Freezing Point	N/A	
Vapor Pressure	N/A	
Vapor Density	N/A	
Saturated Vapor Conc.	N/A	
SG/Density	1.181 g/cm3	
Bulk Density	N/A	
Odor Threshold	N/A	
Volatile%	N/A	
VOC Content	N/A	
Water Content	N/A	
Solvent Content	N/A	
Evaporation Rate	N/A	
Viscosity	N/A	
Surface Tension	N/A	
Partition Coefficient	N/A	
Decomposition Temp.	N/A	
Flash Point	N/A	
Explosion Limits	N/A	
Flammability	N/A	
Autoignition Temp	N/A	
Refractive Index	N/A	
Optical Rotation	N/A	
Miscellaneous Data	N/A	
Solubility	N/A	

N/A = not available

Section 10 - Stability and Reactivity

STABILITY

Stable: Stable.

Conditions to Avoid: Moisture. Do not allow water to enter container because of violent reaction.
Materials to Avoid: Strong oxidizing agents, Water.

HAZARDOUS DECOMPOSITION PRODUCTS
Hazardous Decomposition Products: Sulfur oxides, Hydrogen sulfide gas.

HAZARDOUS POLYMERIZATION
Hazardous Polymerization: Will not occur

Section 11 - Toxicological Information

ROUTE OF EXPOSURE
Skin Contact: Causes severe burns.
Skin Absorption: May be harmful if absorbed through the skin.
Eye Contact: Causes severe burns.
Inhalation: May be harmful if inhaled. Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract.
Ingestion: Ingestion can cause immediate burning pain in the mouth, throat, abdomen; severe swelling of the larynx and skeletal paralysis affecting the ability to breathe, circulatory shock and convulsions. May be harmful if swallowed.

TARGET ORGAN(S) OR SYSTEM(S)
Lungs. Teeth.

SIGNS AND SYMPTOMS OF EXPOSURE
Exposure may cause: Pulmonary edema. Effects may be delayed. To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated. Symptoms of exposure may include burning sensation, coughing, wheezing, laryngitis, shortness of breath, headache, nausea, and vomiting. Inhalation may result in spasm, inflammation and edema of the larynxand bronchi, chemical pneumonitis, and pulmonary edema. Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin.

Section 12 - Ecological Information

No data available.

Section 13 - Disposal Considerations

APPROPRIATE METHOD OF DISPOSAL OF SUBSTANCE OR PREPARATION
Contact a licensed professional waste disposal service to dispose of this material. Observe all federal, state, and local environmental regulations.

Section 14 - Transport Information

DOT
Proper Shipping Name: Sulfuric acid [with not more than 51% acid]
UN#: 2796
Class: 8
Packing Group: Packing Group II
Hazard Label: Corrosive
PIH: Not PIH

IATA
Proper Shipping Name: Sulphuric acid
IATA UN Number: 2796

Hazard Class: 8
Packing Group: II

Section 15 - Regulatory Information

EU DIRECTIVES CLASSIFICATION
Symbol of Danger: C
Indication of Danger: Corrosive.
R: 35
Risk Statements: Causes severe burns.
S: 26-30-45
Safety Statements: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Never add water to this product. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

US CLASSIFICATION AND LABEL TEXT
Indication of Danger: Corrosive.
Risk Statements: Causes severe burns.
Safety Statements: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Never add water to this product. Wear suitable protective clothing, gloves, and eye/face protection. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
US Statements: Target organ(s): Teeth. Cardiovascular system.

UNITED STATES REGULATORY INFORMATION
SARA LISTED: No

CANADA REGULATORY INFORMATION
WHMIS Classification: This product has been classified in accordance with the hazard criteria of the CPR, and the MSDS contains all the information required by the CPR.
DSL: Yes
NDSL: No

Section 16 - Other Information

DISCLAIMER
For R&D use only. Not for drug, household or other uses.

WARRANTY
The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Inc., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale.

COLUMBUS CHEMICAL INDUSTRIES INC.

Safety Data Sheet

Nitric Acid, 10% (w/w)

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: Nitric Acid, 10% (w/w)

Synonyms/Generic Names: None

Product Number: 9106

Product Use: Industrial, Manufacturing or Laboratory use

Manufacturer: Columbus Chemical Industries, Inc.
N4335 Temkin Rd.
Columbus, WI. 53925

For More Information Call: 920-623-2140 (Monday-Friday 8:00-4:30)

In Case of Emergency Call: CHEMTREC - 800-424-9300 or 703-527-3887 (24 Hours/Day, 7 Days/Week)

2. HAZARDS IDENTIFICATION

OSHA Hazards: Target organ effect, Corrosive

Target Organs: Lungs, Teeth, Cardiovascular system

Signal Words: Danger

Pictograms:

GHS Classification:

Skin corrosion	Category 1A
Serious eye damage	Category 1

GHS Label Elements, including precautionary statements:

Hazard Statements:

H314	Causes severe skin burns and eye damage.

Precautionary Statements:

P280	Wear protective gloves/protective clothing/eye protection/face protection.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do so. Continue rinsing.
P310	Immediately call a POISON CENTER or doctor/physician.

Potential Health Effects

Eyes	Causes eye irritation.
Inhalation	May be harmful if inhaled. Causes respiratory tract irritation.
Skin	May be harmful if absorbed through skin. Causes skin irritation.
Ingestion	May be harmful if swallowed.

NFPA Ratings

Health	3
Flammability	0
Reactivity	1
Specific hazard	OX

HMIS Ratings

Health	3
Fire	0
Reactivity	1
Personal	J

3. COMPOSITION/INFORMATION ON INGREDIENTS

Component	Weight %	CAS #	EINECS# / ELINCS#	Formula	Molecular Weight
Nitric Acid	10	7697-37-2	231-714-2	HNO_3	63.01 g/mol
Water	Balance	7732-18-5	231-791-2	H_2O	18.00 g/mol

4. FIRST-AID MEASURES

Eyes	In case of eye contact, rinse with plenty of water and seek medical attention immediately.
Inhalation	Move casualty to fresh air and keep at rest. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Get medical attention immediately.
Skin	Immediately flush with plenty of water for at least 15 minutes while removing contaminated clothing and wash using soap. Get medical attention immediately.
Ingestion	**Do Not Induce Vomiting!** Never give anything by mouth to an unconscious person. If conscious, wash out mouth with water. Get medical attention immediately.

5. FIRE-FIGHTING MEASURES

Suitable (and unsuitable) extinguishing media	Product is not flammable. Use appropriate media for adjacent fire. Cool containers with water.
Special protective equipment and precautions for firefighters	Wear self-contained, approved breathing apparatus and full protective clothing, including eye protection and boots.
Specific hazards arising from the chemical	Emits toxic fumes (nitrogen oxides) under fire conditions. (See also Stability and Reactivity section).

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	See section 8 for recommendations on the use of personal protective equipment.
Environmental precautions	Prevent spillage from entering drains. Any release to the environment may be subject to federal/national or local reporting requirements.
Methods and materials for containment and cleaning up	Neutralize spill with sodium bicarbonate or lime. Absorb spill with noncombustible absorbent material, then place in a suitable container for disposal. Clean surfaces thoroughly with water to remove residual contamination. Dispose of all waste and cleanup materials in accordance with regulations.

7. HANDLING AND STORAGE

Precautions for safe handling
See section 8 for recommendations on the use of personal protective equipment. Use with adequate ventilation. Wash thoroughly after using. Keep container closed when not in use. Avoid formation of aerosols.

Conditions for safe storage, including any incompatibilities
Store in cool, dry well ventilated area. Keep away from incompatible materials (see section 10 for incompatibilities).

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Occupational exposure controls:

Component	Exposure Limits	Basis	Entity
Nitric Acid	2 ppm 5.2 mg/m^3	TLV	ACGIH
	4 ppm 10 mg/m^3	STEL	ACGIH
	2 ppm 5 mg/m^3	PEL	OSHA
	2 ppm 5 mg/m^3	REL	NIOSH
	4 ppm 10 mg/m^3	STEL	NIOSH
	25 ppm	IDLH	OSHA

TWA: Time Weighted Average over 8 hours of work.
TLV: Threshold Limit Value over 8 hours of work.
REL: Recommended Exposure Limit
PEL: Permissible Exposure Limit
STEL: Short Term Exposure Limit during x minutes.
IDLH: Immediately Dangerous to Life or Health
WEEL: Workplace Environmental Exposure Levels
CEIL: Ceiling

Personal Protection

Eyes	Wear chemical safety glasses or goggles and face shield.
Inhalation	Provide local exhaust, preferably mechanical. If exposure levels are excessive, use an approved respirator.
Skin	Wear nitrile or rubber gloves and a full body suit.
Other	Not Available

Other Recommendations
Provide eyewash stations, quick-drench showers and washing facilities accessible to areas of use and handling.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance (physical state, color, etc.)	Colorless liquid.
Odor	Not Available
Odor threshold	Not Available
pH	Not Available

Melting point/freezing point	Not Available
Initial boiling point and boiling range	100°C (212°F)
Flash point	Not Flammable
Evaporation rate	Not Available
Flammability (solid, gas)	Not Flammable
Upper/lower flammability or explosive limit	Not Explosive
Vapor pressure	123 hPa (17 mmHg) at 20°C (68°F)
Vapor density	Not Available
Density	1.15g/cm^3 at 20°C (68°F)
Solubility (ies)	Soluble in water.
Partition coefficient: n-octanol/water	Not Available
Auto-ignition temperature	Not Available
Decomposition temperature	Not Available

10. STABILITY AND REACTIVITY

Chemical Stability	Stable
Possibility of Hazardous Reactions	Will not occur.
Conditions to Avoid	May discolor on exposure to air and light.
Incompatible Materials	Alkali metals, organic materials, acetic anhydride, acetonitrile, alcohols, acrylonitrile.
Hazardous Decomposition Products	Nitrogen oxides.

11. TOXICOLOGICAL INFORMATION

Acute Toxicity

Skin	Not Available
Eyes	Not Available
Respiratory	Not Available
Ingestion	LDLO Oral – Human – 430 mg/kg

Carcinogenicity

IARC	No components of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
ACGIH	No components of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.
NTP	No components of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA	No components of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Signs & Symptoms of Exposure

Skin	Itching, swelling, redness, burning.
Eyes	Itching, redness, burning, watering eyes.
Respiratory	Burning, choking, shortness of breath, coughing, wheezing, dizziness.
Ingestion	Burning, choking, nausea, vomiting, pain.

Chronic Toxicity	Not Available
Teratogenicity	Tetotoxicity (except death)
Mutagenicity	Not Available
Embryotoxicity	Tetotoxicity (except death)
Specific Target Organ Toxicity	Not Available

12. ECOLOGICAL INFORMATION

Ecotoxicity

Aquatic Vertebrate	LC50 – Gambusia affinis – 72 mg/L – 96h
Aquatic Invertebrate	Not Available
Terrestrial	Not Available

Persistence and Degradability	Not Available
Bioaccumulative Potential	Not Available
Mobility in Soil	Not Available
PBT and vPvB Assessment	Not Available
Other Adverse Effects	Not Available

13. DISPOSAL CONSIDERATIONS

Waste Residues	Users should review their operations in terms of the applicable federal/national or local regulations and consult with appropriate regulatory agencies if necessary before disposing of waste product container.
Product Containers	Users should review their operations in terms of the applicable federal/national or local regulations and consult with appropriate regulatory agencies if necessary before disposing of waste product container.

The information offered in section 13 is for the product as shipped. Use and/or alterations to the product may significantly change the characteristics of the material and alter the waste classification and proper disposal methods.

14. TRANSPORTATION INFORMATION

US DOT	UN2031, Nitric acid, 8, pg II
TDG	UN2031, NITRIC ACID, 8, pg II
IMDG	UN2031, NITRIC ACID, 8, pg II
Marine Pollutant	No
IATA/ICAO	UN2031, Nitric acid, 8, pg II

15. REGULATORY INFORMATION

TSCA Inventory Status	All ingredients are listed on the TSCA inventory.
DSCL (EEC)	All ingredients are listed on the DSCL inventory.
California Proposition 65	Not Listed
SARA 302	Listed: Nitric Acid
SARA 304	Listed: Nitric Acid
SARA 311	Nitric Acid
SARA 312	Nitric Acid
SARA 313	Listed: Nitric Acid
WHMIS Canada	CLASS C: Oxidizing material. CLASS E: Corrosive material.

16. OTHER INFORMATION

Revision	Date
Revision 1	12/04/2012