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MSDS

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**** MATERIAL SAFETY DATA SHEET ****

Potassium Iodate
19445

**** SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION ****

MSDS Name: Potassium Iodate
Catalog Numbers: S77550, S77550-1, P253 100, P253 500, P253-100, P253-500, P253100,
P253500, S71980-1, S71980-2, S71980-3
Synonyms:
Iodic Acid Potassium Salt.
Company Identification:
Fisher Scientific
1 Regent Lane
Fairport, NY 11731
Emergency Number: call: 201-798-7100 07410
For CHEMTREC assistance, call: 800-424-9300
For International CHEMTREC assistance, call: 703-527-3887

**** SECTION 2 - COMPOSITION, INFORMATION ON INGREDIENTS ****

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

Hazard Symbols: 0
Risk Phrases: 22 8

**** SECTION 3 - HAZARDS IDENTIFICATION ****

EMERGENCY OVERVIEW

Appearance: white.
Danger! Strong oxidizer. Contact with other material may cause a fire. May cause kidney damage. May cause central nervous system effects. Can be explosive when exposed to heat or flames. 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:
Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.
Skin:
Flush skin with plenty of soap and 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 victim from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear. DO NOT use mouth-to-mouth respiration.
Notes to Physician:
Treat symptomatically and

**** 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 combustible materials may cause a 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 cause explosion hazard.
Extinguishing Media:
Contact professional fire-fighters immediately. Cool containers with flooding quantities of water until well after fire is extinguished. NEVER USE WATER ONLY. For large fires flood fire with water from a distance.

**** SECTION 6 - ACCIDENTAL RELEASE MEASURES ****

General Information: Use proper personal protective equipment as indicated in section 9.
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. Remove all sources of ignition.

**** SECTION 7 - HANDLING AND STORAGE ****

Handling:
Wash thoroughly after handling. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with clothing and other combustible materials. Do not get on skin or in eyes. Avoid ingestion and inhalation. Avoid mechanical shock and friction.
Storage:
Keep away from heat, sparks, and flame. Do not store near combustible materials. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from reducing agents.

**** SECTION 8 - EXPOSURE CONTROLS, PERSONAL PROTECTION ****

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

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

OSHA Vacated PELs:

Potassium Iodate:
No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes:
Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.
Skin:
Wear appropriate gloves to prevent skin exposure.
Clothing:
Wear a chemical apron. Wear appropriate clothing to prevent skin exposure.

Respirators:
Follow the OSHA respirator regulations found in 29CFR 1910.134 or European Standard EN149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

**** SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES ****

Physical State: Solid
Appearance: white
Odor: odorless
pH: Not available.
Vapor Pressure: Not available.
Density: Not available.
Evaporation Rate: Not available.
Boiling Point: Not available.
Freezing/Melting Point: 1040 deg F
Autoignition Temperature: Not available.
Flash Point: (est.) Health: 2; Flammability: 0; Reactivity: 1
NFPA Rating: Not available.
Explosion Limits, Lower: Not available.
Explosion Limits, Upper: 1040 F
Decomposition Temperature: 1040 F
Solubility: Soluble in water
Specific Gravity/Density: 3.93
Molecular Formula: KIO3

**** MATERIAL SAFETY DATA SHEET ****

Sodium Tetraborate Decahydrate
 21010

**** SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION ****

MSDS Name: Sodium Tetraborate Decahydrate
 Catalog Numbers:
 S80172, B80, BP175 500, BP175500, S246, S246-12, S246-212, S246-500, S2465212, S246250LB, S246500, S248 10, S248 3, S248 500, S248-10, S248-3, S248-500, S2483, S248500, S249 500, S249-500, S249500
 Synonyms:
 Buffer Salt pH 9.18; Borax, Sodium Borate Decahydrate
 Company Identification:
 Fisher Scientific
 1 Riverside Drive
 Fair Lawn, NJ 07410
 For information, call: 201-796-7100
 Emergency Number: 201-796-7100
 For CHEMTREC assistance, call: 800-424-9300
 For International CHEMREC assistance, call: 703-527-3887

**** SECTION 2 - COMPOSITION, INFORMATION ON INGREDIENTS ****

CAS#	Chemical Name	%	KINECS#
1203-96-4	Sodium Tetraborate Decahydrate	100	unlisted

**** SECTION 3 - HAZARDS IDENTIFICATION ****

EMERGENCY OVERVIEW

Appearance: white.
 Caution! May cause reproductive effects based upon animal studies.
 May cause eye and skin irritation. May cause respiratory and digestive tract irritation.
 Target Organs: None.

Potential Health Effects

Eye: May cause eye irritation.
 Skin: May cause skin irritation.
 Ingestion: May cause irritation of the digestive tract. Human fatalities have been reported from acute poisoning.
 Inhalation: May cause respiratory tract irritation.
 Chronic: No information found.

**** SECTION 4 - FIRST AID MEASURES ****

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.
 Skin: Flush skin with plenty of soap and 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: Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water. Wash mouth out with water.
 Inhal: Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.
 Notes to Physician: Treat symptomatically and supportively.

**** SECTION 5 - FIRE FIGHTING MEASURES ****

General Information:
 As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Runoff from fire control or dilution water may cause pollution.
 Extinguishing Media: appropriate to extinguish fire. Use water spray, dry chemical, carbon dioxide, or appropriate foam.

**** SECTION 6 - ACCIDENTAL RELEASE MEASURES ****

General Information: Use proper personal protective equipment as indicated in Section 8.
 Spills/Leaks:

**** SECTION 7 - HANDLING AND STORAGE ****

Vacuum or sweep up material and place into a suitable disposal container immediately, observing precautions in the Protective Equipment Section. Avoid generating dusty conditions. Provide ventilation.

**** SECTION 8 - EXPOSURE CONTROLS, PERSONAL PROTECTION ****

Handling: thoroughly after handling. Use with adequate ventilation. Wash immediately after contact with eyes, skin, and clothing. Do not get on face, hair, or clothing. Keep container tightly closed. Avoid ingestion and inhalation.
 Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

**** SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES ****

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

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Sodium Tetraborate Decahydrate	anhydrous: 1 mg/m3 decahydrate: 5 mg/m3 pentahydrate: 1 mg/m3	5 mg/m3 TWA	none listed

OSHA Vacated PELs:

Sodium Tetraborate Decahydrate:
 10 mg/m3 TWA

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.
 Skin: Wear appropriate protective gloves to prevent skin exposure.
 Clothing: Wear appropriate protective clothing to prevent skin exposure.
 Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z89.5 requirements. Respirators on European Standard EN 149 must be followed whenever workplace conditions warrant a respirator's use.

**** SECTION 10 - STABILITY AND REACTIVITY ****

Chemical Stability:
 Stable at room temperature in closed containers under normal storage and handling conditions.
 Conditions to Avoid:
 Incompatible materials, dust generation, excess heat.
 Incompatibilities with Other Materials:

Physical State:

Appearance: Solid
 Color: white
 Odor: Not available.
 pH: Not available.
 Vapor Pressure: Not available.
 Vapor Density: Not available.
 Evaporation Rate: Not available.
 Boiling Point: Not available.
 Freezing/Melting Point: 370 deg C @ 760.00mm Hg
 Autoignition Temperature: Not available.
 Flash Point: Not available.
 NFPA Rating: (est.) Health: 2; Flammability: 0; Reactivity: 0
 Explosion Limits, Lower: Not available.
 Explosion Limits, Upper: Not available.
 Decomposition Temperature: Not available.
 Solubility: soluble
 Specific Gravity/Density: 1.73009/cm3
 Molecular Formula: B4O5H10
 Molecular Weight: 381.36

Strong oxidizing agents, strong acids.
 Hazardous Decomposition Products:
 Irritating and toxic fumes and gases, oxides of boron.
 Hazardous Polymerization: Will not occur.

*** SECTION 11 - TOXICOLOGICAL INFORMATION ***

RTECS#:
 CAS# 1303-96-4: VZ2275000
 LD50/LC50:
 CAS# 1303-96-4: Oral, mouse; LD50 = 2 gm/kg; Oxal, rat; LD50 = 2660 mg/kg.
 Carcinogenicity:
 Sodium Tetraborate Decahydrate -
 Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA.
 Epidemiology:
 No information available.
 Teratogenicity:
 No information available.
 Reproductive Effects:
 No information available.
 Neurotoxicity:
 No information available.
 Mutagenicity:
 No information available.
 Other Studies:
 See actual entry in RTECS for complete information.

*** SECTION 12 - ECOLOGICAL INFORMATION ***

*** 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 disposal.
 RCRA P-Series: None listed.
 RCRA U-Series: None listed.

*** SECTION 14 - TRANSPORT INFORMATION ***

US DOT
 No information available.
 Canadian TDG
 No information available.

*** SECTION 15 - REGULATORY INFORMATION ***

US FEDERAL
 TSCA
 Section 302 (FQ)
 None of the chemicals in this material have an FQ.
 Section 302 (TPO)
 None of the chemicals in this product have a TPO.
 SARA
 CAS # 1303-96-4: chronic.
 Section 313
 No chemicals are reportable under Section 313.
 Clean Air Act:
 This material does not contain any hazardous air pollutants.
 This material does not contain any Class 1 Ozone depleters.
 This material does not contain any Class 2 Ozone depleters.
 Clean Water Act:
 None of the chemicals in this product are listed as Hazardous Substances under the CWA.
 None of the chemicals in this product are listed as Priority Pollutants under the CWA.
 None of the chemicals in this product are listed as Toxic Pollutants under the CWA.
 OSHA
 None of the chemicals in this product are considered highly hazardous by OSHA.
 STATE
 Sodium Tetraborate Decahydrate can be found on the following state right to know lists: California, New Jersey, Florida, Pennsylvania,

Minnesota, Massachusetts.
 California, No significant risk level.
 None of the chemicals in this product are listed.
 European/International Regulations
 European Labeling in Accordance with EC Directives
 Hazard Symbols: Not available.
 Risk Phrases:
 Safety Phrases:
 WGK (Waste Danger/Protection)
 CAS# 1303-96-4: 1
 United Kingdom: Physical Exposure Limits
 CAS# 1303-96-4: OBS-United Kingdom, TWA 5 mg/m3 TWA

Canada
 CAS# 1303-96-4 is listed on Canada's DSL/NDSL List.
 This product has a WHMIS classification of D2A, D2B.
 CAS# 1303-96-4 is not listed on Canada's Ingredient Disclosure List.
 Exposure
 CAS# 1303-96-4: OEL-AUSTRALIA:TWA 5 mg/m3
 OEL-BELGIUM:TWA 5 mg/m3
 OEL-DENMARK:TWA 5 mg/m3
 OEL-FRANCE:TWA 5 mg/m3
 OEL-THE NETHERLANDS:TWA 5 mg/m3
 OEL-SWEDEN:TWA 2 mg/m3; STEL 5 mg/m3; SKIN
 OEL-SWITZERLAND:TWA 5 mg/m3
 OEL-UNITED KINGDOM:TWA 5 mg/m3
 OEL-UNITED STATES: COLONIA, ORDAN, KOREA check ACCIH TLV
 OEL IN NEW ZEALAND, SINGAPORE, VIETNAM check ACCI TLV

*** SECTION 16 - ADDITIONAL INFORMATION ***

MEDS Creation Date: 7/96/1999 Revision #3 Date: 10/12/2000

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of accuracy, either explicitly 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 accuracy of the information for their particular purposes. In no way shall the company be liable for any claims, losses, or damages of any third party or for any profits or any special, indirect, incidental, consequential or exemplary damages, however arising, even if the company has been advised of the possibility of such damages.

**** MATERIAL SAFETY DATA SHEET ****

Starch, Soluble and Hydrolysed
 21875

**** SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION ****
 MSDS Name: Starch, Soluble and Hydrolysed
 Catalog Numbers: S71202, S78931-1, S78931-2, S79015, S79016, S516 100, S516 500,
 S516-100, S516-500, S516100, S516500, S676 2, S676-2, S6762

Synonyms: Starch; Potato Starch; Iodine indicator
 Company Identification: Fisher Scientific
 Fair Lawn, NJ 07410

For information, call: 201-796-7100
 Emergency Number: 201-796-7100
 For CHEMTREC assistance, call: 800-424-9300
 For International CHEMRECALL assistance, call: 703-527-3887

**** SECTION 2 - COMPOSITION, INFORMATION ON INGREDIENTS ****

CAS#	Chemical Name	%	ELINECS#
9005-25-8	STARCH	app. 100	232-679-6

**** SECTION 3 - HAZARDS IDENTIFICATION ****

EMERGENCY OVERVIEW

Appearance: white.
 Caution! May cause respiratory tract irritation. This is expected to be a low hazard for usual industrial handling. May cause eye and skin irritation.
 Target Organs: None.

Potential Health Effects

Eye: May cause eye irritation.
 Skin: May cause mild skin irritation. Low hazard for usual industrial handling.
 Ingestion: Low hazard for usual industrial handling.
 Inhalation: May cause respiratory tract irritation. Low hazard for usual industrial handling.
 Chronic: NO information found.

**** SECTION 4 - FIRST AID MEASURES ****

Eyes: Flush eyes with plenty of water for at least 15 minutes, discontinuing if stinging the upper and lower eyelids. If irritation develops, get medical aid.
 Skin: Get medical aid if irritation develops or persists. Flush skin with plenty of soap and water.
 Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Get medical aid if irritation or symptoms occur.
 Inhalation: Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.
 Notes to Physician: No specific antidote exists. Treat symptomatically and

**** 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. Dusts at sufficient concentrations can form explosive mixtures with air.
 Extinguishing Media: For small fires, use water spray, dry chemical, carbon dioxide or chemical foam.

**** SECTION 6 - ACCIDENTAL RELEASE MEASURES ****

General Information: Use proper personal protective equipment as indicated in Section 8.
 Spills/Leaks: Sweep up, then place into a suitable container for disposal. Avoid generating dusty conditions.

**** SECTION 7 - HANDLING AND STORAGE ****

Handling: Wash thoroughly after handling. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with skin and eyes. Avoid ingestion and inhalation.
 Store in a cool, dry, well-ventilated area away from incompatible substances.

**** SECTION 8 - EXPOSURE CONTROLS, PERSONAL PROTECTION ****

Engineering Controls: Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.
 Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
STARCH	10 mg/m3	total: 10 mg/m3 TWA; respirable dust: 5 mg/m3 TWA	total dust: 15 mg/m3 TWA; respirable fraction: 5 mg/m3 TWA

OSHA Vacated PELs:

STARCH:
 total dust: 15 mg/m3 TWA; respirable fraction: 5 mg/m3 TWA

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 minimize contact with skin.
 Respirators: Follow the OSHA respirator regulations found in 29CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

**** SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES ****

Physical State: Solid
 Appearance: white
 Odor: odorless
 pH: 4.5-6 (2% solution)
 Vapor Pressure: Negligible.
 Evaporation Rate: Not available.
 Volatility: Negligible.
 Boiling Point: Not available.
 Freezing/Melting Point: Not available.
 Autoignition Temperature: Not available.
 Flash Point: Not available.
 NFPA Rating: (est.) Health: 1; Flammability: 0; Reactivity: 0
 Explosion Limits, Lower: Not available.
 Explosion Limits, Upper: Not available.
 Solubility: Soluble in boiling water
 Specific Gravity/Density: 1.5
 Molecular Formula: C6H10O5x
 Molecular Weight: varies

**** SECTION 10 - STABILITY AND REACTIVITY ****

Chemical Stability: Stable under normal temperatures and pressures.
 Conditions to Avoid: High temperatures, incompatible materials.
 Incompatibilities with Other Materials: Oxidizing agents.
 Hazardous Decomposition Products: Carbon dioxide.
 Hazardous Polymerization: Has not been reported.

**** SECTION 11 - TOXICOLOGICAL INFORMATION ****

RTCS#:

CAS# 9005-25-8: GM5090000
LD50/LC50:
Not available.
Carcinogenicity:
STARCH - ACCIH: A4 - Not Classifiable as a Human Carcinogen
Epidemiology:
No information available.
Teratogenicity:
No information available.
Reproductive Effects:
No information available.
Neurotoxicity:
No information available.
Mutagenesis:
Please refer to RUCS# GM5090000 for specific information.
Other Studies:
None.

**** SECTION 12 - ECOLOGICAL INFORMATION ****
Other
No information 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
No information available
Canadian TDG
No information available.

**** SECTION 15 - REGULATORY INFORMATION ****
US FEDERAL
TSCA
CAS# 9005-25-8 is listed on the TSCA inventory.
Health & Safety Reporting List
None of the chemicals are on the Health & Safety Reporting List.
Chemical Test Rules
None of the chemicals in this product are under a Chemical Test Rule.
Section 12b
None of the chemicals are listed under TSCA Section 12b.
TSCA Significant New Use Rule
None of the chemicals in this material have a SNUR under TSCA.

SARA
None of the chemicals in this material have a SNUR under TSCA.
Section 302 (HQ)
None of the chemicals in this material have an HQ.
Section 302 (FPQ)
None of the chemicals in this product have a FPQ.
Section 313
None of the chemicals are reportable under Section 313.
Clean Air Act:
This material does not contain any hazardous air pollutants.
This material does not contain any Class 1 Ozone Depleters.
Clean Water Act:
None of the chemicals in this product are listed as Hazardous Substances under the CWA.
None of the chemicals in this product are listed as Priority Pollutants under the CWA.
None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:
None of the chemicals in this product are considered highly hazardous by OSHA.
STATE
STARCH can be found on the following state right to know lists:
Pennsylvania, Minnesota, Massachusetts,
California No Significant Risk Level:
None of the chemicals in this product are listed.
European/International Regulations
European Labeling in Accordance with EC Directives
Risk Phrases: Not available.
Safety Phrases:
WGK (Water Danger/Protection)
CAS# 9005-25-8: 0
United Kingdom Occupational Exposure Limits

Canada
CAS# 9005-25-8 is listed on Canada's DSL/NDSL List.
This product has a WHMIS classification of Not controlled.
CAS# 9005-25-8 is not listed on Canada's Ingredient Disclosure List.
Exposure Limits
CAS# 9005-25-8: OEL-AUSTRALIA:TWA 1.0 mg/m3
OEL-BELGIUM:TWA 1.0 mg/m3
OEL-DENMARK:TWA 6 mg/m3
OEL-GERMANY:TWA 6 mg/m3 (total dust) JAN9
OEL-UNITED KINGDOM:TWA 5 mg (total dust)
OEL IN BULGARIA, COLOMBIA, JORDAN, KOREA, check ACCIH TLV
OEL IN NEW ZEALAND, SINGAPORE, VIETNAM check ACGL TLV
**** SECTION 16 - ADDITIONAL INFORMATION ****
MSDS Creation Date: 7/01/1998 Revision #2 Date: 8/02/2000

The information above is believed to be accurate and represents the best information currently available to us. However, we make no 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 way 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, however caused, in whole or in part, by the use of the information. The possibility of such damages is hereby acknowledged.

**** MATERIAL SAFETY DATA SHEET ****

Sulfuric Acid

**** SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION ****

MSDS Name: Sulfuric Acid
Catalog # 571211, 571211SC, 571826, 579200, 580213, 580213-1, 5298 212, A298212, A300 312, A300 225LE, A300 500, A300 612GAL, A300 700LB, A300212, A300225LB, A300500, A300612GAL, A300700LB, A300C 312, A300C212, A300C212001, A300C212002, A300C212003, A300C212004, A300C212005, A300C212006, A300C212007, A300C212008, A300C212009, A300C212010, A300C212LC, A300FP 500, A300FP500, A300FS00, A300F 212, A300F500, A300S 212, A300S 500, A300S212, A300S212LC, A300S500, A300S 212, A300S212, A468-1, A468-250, A468-500, MC349554, MC375554, S71211MF, S71211MF, S71211MF, S71211SCMF, S71211SCMF, S79200MF*DBAZ, S79200MF*DBAZ, S79200SCMF, SAI174 212, SAI174 4, SAI174212, SAI174 4, SAI1764, SAI1764, SAI196 500, SAI196500

Synonyms: Hydrogen Sulfate; Oil of Vitriol; Vitriol Brown Oil; Metting Acid; Battery Acid; Sulphuric Acid.

Company Identification: Fisher Scientific

1 Resagent Lane

For information, call: 201-756-7100 NJ 07410

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

**** SECTION 2 - COMPOSITION, INFORMATION ON INGREDIENTS ****

CAS#	Chemical Name	%	HMCS#
7664-93-9	Sulfuric acid	95-98.0	231-639-5

Hazard Symbols: C

Risk Phrases: 35 8

**** SECTION 3 - HAZARDS IDENTIFICATION ****

Appearance: clear colorless - oily liquid

Danger! Strong oxidizer. Contact with other material may cause a fire. Corrosive. Hygroscopic. May cause kidney damage. May cause fetal effects based upon animal studies. May cause lung damage.

Causes eye and skin burns. Cancer hazard. May be fatal if inhaled.

May cause severe respiratory tract irritation with possible burns.

May cause severe digestive tract irritation with possible burns. May cause severe eye, skin and respiratory tract irritation with possible

Target Organs: Kidneys, heart, lungs, respiratory system, cardiovascular system, teeth, eyes.

Potential Health Effects

Eye: Causes severe eye burns. May cause irreversible eye injury. May cause conjunctivitis. May cause permanent corneal opacification.

Skin: Causes skin burns. Continued contact can cause tissue necrosis. May cause skin rash (in milder cases), and cold and clammy skin with cyanosis or pale color.

Ingestion: May cause severe and permanent damage to the digestive tract. Causes gastrointestinal tract burns. May cause systemic toxicity with inhalation.

May cause irritation of the respiratory tract with burning pain in the nose and throat, coughing, wheezing, shortness of breath and pulmonary edema. Causes chemical burns to the respiratory tract.

Inhalation may be fatal as a result of spasm, inflammation, edema of the larynx and bronchi, chemical pneumonitis and pulmonary edema.

Causes corrosive action on the mucous membranes.

Prolonged or repeated inhalation may cause kidney and lung damage.

Prolonged or repeated skin contact may cause dermatitis. Prolonged or repeated inhalation may cause nosebleeds, nasal congestion, erosion of the teeth, perforation of the nasal septum, chest pain and bronchitis. Prolonged or repeated eye contact may cause conjunctivitis. May cause fetal effects. May cause cancer in humans.

Effects may be delayed. Laboratory experiments have resulted in mutagenic effects. May cause ischemic heart lesions.

**** SECTION 4 - FIRST AID MEASURES ****

Eyes: Get medical aid immediately. Do NOT allow victim to rub or keep eyes

Skin: Get medical aid immediately. Immediately flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Destroy contaminated shoes.

Ingestion: Do NOT induce vomiting. If victim is conscious and alert, give 2-4 cupsful of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation: Get medical aid immediately. Remove victim to fresh air immediately. If breathing is difficult, give oxygen. Do NOT use mouth-to-mouth respiration. If breathing has ceased, use artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask.

Notes to Physician: Monitor arterial blood gases, chest x-ray, and pulmonary function tests if respiratory tract irritation or respiratory depression is evident. Treat dermal irritation or burns with standard topical agent. Effect may be delayed. Do Not use sodium bicarbonate in an attempt to neutralize the acid.

Antidote: Do Not use oils or ointments in eye.

**** SECTION 5 - FIRE FIGHTING MEASURES ****

General Information: wear a self-contained breathing apparatus in proximity to fire, MSHA/NIOSH approved equivalent, and full protective gear. Strong oxidizer. Contact with flammable materials may cause a fire. Wear appropriate protective clothing and equipment (SCBA) to prevent contact with thermal decomposition products. Use water to prevent contact with flooding amounts. Will react with water to form toxic and corrosive fumes. Contact with water can cause violent liberation of heat and splattering of the material. Some oxidizers may react explosively with hydrocarbons (fuel). Contact with metals may result in a fire. Containers may accelerate burning if involved in a fire. Containers may explode if heated or if contaminated with water. Runoff from fire control or dilution water may cause pollution.

Extinguishing Media: Do NOT use water directly on fire. Use carbon dioxide or dry chemical. Do NOT get water inside containers. Contact professional firefighters immediately. Cool containers with flooding quantities of water until well below normal boiling point. Do NOT use water on dry chemicals. Carbon dioxide is not suitable for use on large fires. Flood fire with water from a distance. NEVER use water on a fire area with large quantities of water, while knocking down vapors with water fog.

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Provide ventilation. Use water spray to reduce vapors, do not put water directly on leak, spill area or inside containers. Cover with dry earth, dry sand, or other non-combustible material. Do not use water to clean up spill. Do not use water to clean up spill. Do not use water to clean up spill. Do not use water to clean up spill.

Storage: not store near combustible materials. Keep container closed when not in use. Store in cool, well-ventilated area away from incompatible substances. Keep away from water. Containers do not store near alkaline substances. Store protected from moisture.

**** SECTION 6 - ACCIDENTAL RELEASE MEASURES ****

Handling: thoroughly after handling. Remove contaminated clothing and wash before reuse. Use adequate ventilation. Minimize dust generation and accumulation. Do not get on skin or in eyes. Clothing and other combustible materials. Avoid contact with clothing and other combustible materials. Do not get on skin or in eyes. Avoid ingestion and inhalation. Do not ingest or inhale. Do not allow contact with water. Use only in a chemical fume hood. Discard contaminated shoes. Keep from contact with moist air and steam.

Storage: not store near combustible materials. Keep container closed when not in use. Store in cool, well-ventilated area away from incompatible substances. Keep away from water. Containers do not store near alkaline substances. Store protected from moisture.

**** SECTION 8 - EXPOSURE CONTROLS, PERSONAL PROTECTION ****

Engineering Controls: Facilities engineering or utilizing this material should be equipped with an eyewash facility and a safety shower. Use only under a chemical fume hood.

Chemical Name	Exposure Limits	
	ACGIH	NIOSH
Sulfuric acid	1 mg/m ³ ; 3 mg/m ³	1 mg/m ³ TWA 15 1 mg/m ³ IDLH
OSHA Vacated PELs: Sulfuric acid: 1 mg/m ³ TWA		OSHA - Final PELs 1 mg/m ³ TWA

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 29CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

**** SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES ****

Physical State: Liquid

Appearance: clear colorless - oily liquid

Odor: odorless

Boiling Point: 0.3 (in Solution)

Vapor Pressure: 2 mm Hg @ 145.8 C

Vapor Density: 3

Evaporation Rate: Slower than ether.

Viscosity: 21 mPas @ 25 C

Freezing/Melting Point: 340 deg C

Autoignition Temperature: 10.35 deg C

Flash Point: Not available.

Upper Explosive Limit: Not available.

Lower Explosive Limit: Not available.

Decomposition Temperature: 340 deg C

Solubility: Soluble.

Specific Gravity/Density: 1.841

Molecular Formula: H2SO4

Molecular Weight: 98.0716

**** SECTION 10 - STABILITY AND REACTIVITY ****

Chemical Stability: Combines vigorously with water with the evolution of heat. Reported to have exploded when in a sealed container. This was most likely due to pressure of hydrogen by reduction of water.

Conditions for Safe Storage: Store in compatible materials, ignition sources, metals, excess heat, to moist air or water, oxidizers, amines, bases.

Incompatibilities with Other Materials: Bases, strong dehydrating agents, organic materials, finely powdered metals, moisture, carbides, chlorates, cyanides (e.g. potassium alkali halide cyanides, fulminates, picrates, nitrates, perchlorates, nitromethane, phosphorus, lithium perchlorate, cyclohexanone oxime, nitroaryl amines, lithium sulfide, mercuric nitride, benzene, potassium chlorate, steel, cesium, acetylene carbide, trihydroxydiamino phosphate, phosphorus trioxide, reducing agents.

Hazardous Decomposition Products: Hazardous during fire: irritating and toxic fumes and gases. Hazardous Polymerization: Has not been reported.

**** SECTION 11 - TOXICOLOGICAL INFORMATION ****

RTECS#: CAS# 7664-93-9; WS5600000

LD50: CAS# 7664-93-9; Inhalation, mouse; LC50 = 220 mg/m³/2H; Inhalation, rat; LC50 = 510 mg/m³/2H; Oral, rat; LD50 = 2140 mg/kg.

Carcinogenicity: Sulfuric acid - (contained in strong inorganic acid mists): A2 - Suspected

ACGIH: (contained in strong inorganic acid mists): A2 - Suspected

OSHA: Select carcinogen
 IARC: Group 1 carcinogen

Epidemiology: No data available.

Teratogenicity: No data available.

Reproductive Effects: No data available.

Neurotoxicity: No data available.

Mutagenicity: No data available.

Other Studies: No data available.

**** SECTION 12 - ECOLOGICAL INFORMATION ****

Ecotoxicity: Fish: Bluegill/Sunfish: 49 mg/L; 48Hr; Flm (tap water @ 20C) Fish; Bluegill/Sunfish: 24.5 ppm; 48Hr; Flm (fresh water).

**** SECTION 13 - DISPOSAL CONSIDERATIONS ****

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. 40 CFR subchapter I, for the classification determination are listed in and local hazardous 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: SULFURIC ACID
 Hazard Class: 8
 UN Number: UN1830
 Packing Group: II
 Canadian TDG Shipping Name: SULFURIC ACID
 Hazard Class: 8 (9.2)
 UN Number: UN1830

**** SECTION 15 - REGULATORY INFORMATION ****

US FEDERAL TSCA CAS# 7664-93-9 is listed on the TSCA inventory. Health & Safety Reporting List. Chemical Test Rule. Chemicals are on the Health & Safety Reporting List. None of the chemicals in this product are under a Chemical Test Rule. Section 12b. None of the chemicals are listed under TSCA Section 12b. TSCA Significant New Use Rule. None of the chemicals in this material have a SNUR under TSCA. SARA Section 302 (FQ) CAS# 7664-93-9: final RQ = 1000 pounds (454 kg)
 Section 302 (TPO) CAS# 7664-93-9: TPQ = 1000 pounds
 SARA Codes CAS # 7664-93-9: acute, chronic, reactive.
 This chemical is not at a high enough concentration to be reportable under Section 313.
 Clean Air Act: No chemicals are reportable under Section 313.
 Clean Air Act: This material does not contain any hazardous air pollutants. This material does not contain any Class 1 Ozone depleters. This material does not contain any Class 2 Ozone depleters.
 Clean Water Act: CAS# 7664-93-9 is listed as a Hazardous Substance under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA: None of the chemicals in this product are considered highly hazardous by OSHA.

STATE Sulfuric acid can be found on the following state right to know lists: California, New Jersey, Florida, Pennsylvania, Minnesota, Massachusetts. California No. Significant Risk Level: European/International Regulations product are listed. European Labeling in Accordance with EC Directives

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Hazard Symbols: C
Risk Phrases: R 35 Causes severe burns.
R 8 Contact with combustible material may cause fire.

Safety Phrases: S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S 37 In case of contact with skin, wash with plenty of water and soap. Do not use this product.
S 45 In case of accident or fire, do not breathe the fumes. In case of fire, seek medical advice immediately (show the label where possible).

WGK (Water Danger/Protection)
CAS# 7664-93-9: 2
United Kingdom Occupational Exposure Limits
CAS# 7664-93-9: OES-United Kingdom, TWA 1 mg/m3 TWA

Canada

CAS# 7664-93-9 is listed on Canada's DSL/WDSL List.
This product has a WHMIS classification of E, D1A.
CAS# 7664-93-9 is not listed on Canada's Ingredient Disclosure List.

Exposure Limits
CAS# 7664-93-9: OEL-ARAB Republic of Egypt: TWA 1 mg/m3
OEL-AUSTRALIA: TWA 1 mg/m3
OEL-BELGIUM: TWA 1 mg/m3; STEL 3 mg/m3
OEL-CANADA: TWA 1 mg/m3; STEL 2 mg/m3
OEL-DENMARK: TWA 1 mg/m3
OEL-FINLAND: TWA 1 mg/m3; STEL 3 mg/m3; Skin
OEL-FRANCE: TWA 1 mg/m3; STEL 3 mg/m3
OEL-GERMANY: TWA 1 mg/m3
OEL-HUNGARY: STEL 1 mg/m3
OEL-JAPAN: TWA 1 mg/m3
OEL-THE NETHERLANDS: TWA 1 mg/m3
OEL-THE PHILIPPINES: TWA 1 mg/m3
OEL-SPAIN: TWA 1 mg/m3; STEL 3 mg/m3; Skin
OEL-RUSSIA: STEL 1 mg/m3
OEL-SWEDEN: TWA 1 mg/m3; STEL 3 mg/m3
OEL-SWITZERLAND: TWA 1 mg/m3; STEL 3 mg/m3
OEL-THAILAND: TWA 1 mg/m3; STEL 2 mg/m3
OEL-TURKEY: TWA 1 mg/m3
OEL-UNITED KINGDOM: TWA 1 mg/m3
OEL IN BULGARIA, COLOMBIA, JORDAN, KOREA check ACCIH TLY
OEL IN NEW ZEALAND, SINGAPORE, VIETNAM check ACCI TLY

**** SECTION 16 - ADDITIONAL INFORMATION ****

MSDS Creation Date: 4/22/1999 Revision #7 Date: 11/20/2000

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to the product. We do not assume any liability resulting from its use. Users should make their own investigations and inquiries to determine the information for their particular purposes. In no way 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.