Material Safety Data Sheet

Chlorosulfonic acid

ACC# 04870

Section 1 - Chemical Product and Company Identification

MSDS Name: Chlorosulfonic acid
Catalog Numbers: O1931-1
Synonyms: Sulfuric chlorohydrin; Chlorosulfuric acid; CSA; Monochlorosulfuric acid; Sulfonic acid, monochloride.
Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100
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	Percent	EINECS/ELINCS
7790-94-5	Chlorosulfonic acid	>97	232-234-6
7664-93-9	Sulfuric acid	<3	231-639-5
7647-01-0	Hydrogen chloride	<0.5	231-595-7

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: oily liquid.
Danger! May be fatal if inhaled, absorbed through the skin or swallowed. Causes eye and skin burns. Water-reactive. Strong oxidizer. Contact with other material may cause a fire. Causes digestive and respiratory tract burns. Hygroscopic (absorbs moisture from the air). Corrosive to metal.
Target Organs: Eyes, skin, mucous membranes.

Potential Health Effects

Eye: Causes severe eye burns. May cause irreversible eye injury. Vapor or mist may cause irritation and severe burns. Lachrymator (substance which increases the flow of tears).
Skin: May be fatal if absorbed through the skin. Causes skin burns. Absorption through the skin may cause circulatory failure leading to kidney failure and liver and heart damage.

Ingestion: May be fatal if swallowed. May cause severe and permanent damage to the digestive tract. May cause severe gastrointestinal tract irritation with nausea, vomiting and possible burns. Causes effects similar to those of acute skin absorption.
Inhalation: May be fatal if inhaled. May cause severe irritation of the respiratory tract with sore throat, coughing, shortness of breath and delayed lung edema.
Chronic: Prolonged or repeated inhalation may cause nosebleeds, nasal congestion, erosion of the teeth, perforation of the nasal septum, chest pain and bronchitis.

Section 4 - First Aid Measures

Eyes: In case of contact, immediately flush eyes with plenty of water for a t least 15 minutes. Get medical aid immediately.
Skin: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid immediately. Wash clothing before reuse.
Ingestion: If swallowed, do NOT induce vomiting. Get medical aid immediately. If victim is fully conscious, give a cupful of water. Never give anything by mouth to an unconscious person.
Inhalation: POISON material. If inhaled, get medical aid immediately. Remove victim to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.
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. Strong oxidizer. Contact with other material may cause fire. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Reacts violently with water. Contact with metals may evolve flammable hydrogen gas. Containers may explode when heated or if contaminated with water.
Extinguishing Media: Use carbon dioxide or dry chemical. Do NOT get water inside containers.
Flash Point: Not available.
Autoignition Temperature: Not available.
Explosion Limits, Lower:Not available.
Upper: Not available.
NFPA Rating: (estimated) Health: 4; Flammability: 0; Instability: 2; Special Hazard: -W-; Special Hazard: OX

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Remove all sources of ignition. Absorb spill using an absorbent, non-combustible material such as earth, sand, or vermiculite. Do not use combustible materials such as sawdust. Isolate area and deny entry. Provide ventilation. Do not expose spill to water. Do not get water inside containers. Evacuate unnecessary personnel. Approach spill from upwind.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Do not allow water to get into the container because of violent reaction. Do not get in eyes, on skin, or on clothing. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Keep container tightly closed. Avoid contact with clothing and other combustible materials. Do not allow contact with water. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames. Do not breathe vapor or mist. Use only with adequate ventilation or respiratory protection.
Storage: Keep container closed when not in use. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from water. Keep away from acids. Do not store in metal containers. Storage under a nitrogen blanket has been recommended. Storage for long periods is not recommended. Separate from alcohols. Store away from alkalies. Do not store in an area equipped with emergency water sprinklers.

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. Use a corrosion-resistant ventilation system.
Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Chlorosulfonic acid	none listed	none listed	none listed
Sulfuric acid	0.2 mg/m3 TWA (thoracic fraction)	1 mg/m3 TWA 15 mg/m3 IDLH	1 mg/m3 TWA
Hydrogen chloride	2 ppm Ceiling	50 ppm IDLH	5 ppm Ceiling; 7 mg/m3 Ceiling

OSHA Vacated PELs: Chlorosulfonic acid: No OSHA Vacated PELs are listed for this chemical. Sulfuric acid: 1 mg/m3 TWA Hydrogen chloride: No OSHA Vacated PELs are listed for this chemical.
Personal Protective Equipment
Eyes: Wear chemical splash goggles and face shield.
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: Liquid
Appearance: clear to slightly cloudy, light yellow - oily
Odor: pungent odor
pH: Not available.
Vapor Pressure: 1 mm Hg @ 32 deg C

Vapor Density: 4.02 (air=1)
Evaporation Rate:Not available.
Viscosity: 3 cps 15.6 deg C
Boiling Point: 151-152 deg C @ 755 mm Hg
Freezing/Melting Point:-80 deg C
Decomposition Temperature:> 151 deg C
Solubility: reacts
Specific Gravity/Density:1.75 g/cm3 @ 20°/4°
Molecular Formula:ClSO3H
Molecular Weight:116.52

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures. Reacts violently with water to form the toxic gases hydrogen chloride and sulfur dioxide.
Conditions to Avoid: Moisture, confined spaces.
Incompatibilities with Other Materials: Water, metals, strong reducing agents, strong acids, strong bases, alcohols, phosphorus, silver nitrate, combustible materials.
Hazardous Decomposition Products: Hydrogen chloride, sulfur dioxide, hydrogen gas, sulfuric acid.
Hazardous Polymerization: Has not been reported

Section 11 - Toxicological Information

RTECS#:
CAS# 7790-94-5: FX5730000
CAS# 7664-93-9: WS5600000
CAS# 7647-01-0: MW4025000; MW4031000
LD50/LC50:
CAS# 7790-94-5:
    Oral, rat: LD50 = 50 mg/kg;

CAS# 7664-93-9:
    Draize test, rabbit, eye: 250 ug Severe;
    Inhalation, mouse: LC50 = 320 mg/m3/2H;
    Inhalation, mouse: LC50 = 320 mg/m3;
    Inhalation, rat: LC50 = 510 mg/m3/2H;
    Inhalation, rat: LC50 = 510 mg/m3;
    Oral, rat: LD50 = 2140 mg/kg;

CAS# 7647-01-0:
    Inhalation, mouse: LC50 = 1108 ppm/1H;
    Inhalation, mouse: LC50 = 20487 mg/m3/5M;
    Inhalation, mouse: LC50 = 3940 mg/m3/30M;
    Inhalation, mouse: LC50 = 8300 mg/m3/30M;
    Inhalation, rat: LC50 = 3124 ppm/1H;
    Inhalation, rat: LC50 = 60938 mg/m3/5M;
    Inhalation, rat: LC50 = 7004 mg/m3/30M;
    Inhalation, rat: LC50 = 45000 mg/m3/5M;
    Inhalation, rat: LC50 = 8300 mg/m3/30M;

Oral, rabbit: LD50 = 900 mg/kg;
Dermal, guinea pig: LD50 = 0.05-0.10 cc/kg = 175 mg/kg. ation, rat: LC50 = 4779 mg/m3/4H or 4.8 mg/l/4H (RTECS). ation, rat: LC50 = 38.5 mg/m3/4H (HSDB). ation, mouse: LC50 = 52.5 mg/m3/2H (HSDB). ation, rat: LC50 = 926 mg/m3/1H
Carcinogenicity:
CAS# 7790-94-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.
CAS# 7664-93-9:

- ACGIH: A2 - Suspected Human Carcinogen (contained in strong inorganic acid mists)
- California: carcinogen, initial date 3/14/03 (listed as Strong inorganic acid mists containing sulfuric acid).
- NTP: Known carcinogen (listed as Strong inorganic acid mists containing s).
- IARC: Group 1 carcinogen

CAS# 7647-01-0: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.
Teratogenicity: No information available.
Reproductive Effects: No information available.
Mutagenicity: No information available.
Neurotoxicity: No information available.
Other Studies:

Section 12 - Ecological Information

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	Canada TDG
Shipping Name:	CHLOROSULFONIC ACID	No information available.
Hazard Class:	8	
UN Number:	UN1754	
Packing Group:	I	

Section 15 - Regulatory Information

US FEDERAL

TSCA
CAS# 7790-94-5 is listed on the TSCA inventory.
CAS# 7664-93-9 is listed on the TSCA inventory.
CAS# 7647-01-0 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# 7790-94-5: 1000 lb final RQ; 454 kg final RQ CAS# 7664-93-9: 1000 lb final RQ; 454 kg final RQ CAS# 7647-01-0: 5000 lb final RQ; 2270 kg final RQ
SARA Section 302 Extremely Hazardous Substances
CAS# 7664-93-9: 1000 lb TPQ CAS# 7647-01-0: 500 lb TPQ
SARA Codes
CAS # 7790-94-5: acute, chronic, flammable, reactive.
CAS # 7664-93-9: acute, chronic, reactive.
CAS # 7647-01-0: acute.
Section 313
This material contains Sulfuric acid (CAS# 7664-93-9, <3%),which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.
Hydrogen chloride is not at a high enough concentration to be reportable under Section 313.
Clean Air Act:
CAS# 7647-01-0 is listed as a hazardous air pollutant (HAP).
This material does not contain any Class 1 Ozone depletors.
This material does not contain any Class 2 Ozone depletors.
Clean Water Act:
CAS# 7790-94-5 is listed as a Hazardous Substance under the CWA. CAS# 7664-93-9 is listed as a Hazardous Substance under the CWA. CAS# 7647-01-0 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:
CAS# 7647-01-0 is considered highly hazardous by OSHA.
STATE
CAS# 7790-94-5 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.
CAS# 7664-93-9 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.
CAS# 7647-01-0 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

California Prop 65
WARNING: This product contains Sulfuric acid, listed as `Strong inorganic acid mists contain', a chemical known to the state of California to cause cancer.
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:
C
Risk Phrases:
R 14 Reacts violently with water.
R 35 Causes severe burns.
R 37 Irritating to respiratory system.

Safety Phrases:
S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

WGK (Water Danger/Protection)
CAS# 7790-94-5: 2
CAS# 7664-93-9: 2
CAS# 7647-01-0: 1
Canada - DSL/NDSL
CAS# 7790-94-5 is listed on Canada's DSL List.
CAS# 7664-93-9 is listed on Canada's DSL List.
CAS# 7647-01-0 is listed on Canada's DSL List.
Canada - WHMIS
This product has a WHMIS classification of C, D1A, E, F.
Canadian Ingredient Disclosure List
CAS# 7790-94-5 is listed on the Canadian Ingredient Disclosure List.
CAS# 7664-93-9 is listed on the Canadian Ingredient Disclosure List.
CAS# 7647-01-0 is listed on the Canadian Ingredient Disclosure List.

Section 16 - Additional Information

MSDS Creation Date: 6/05/1998
Revision #4 Date: 5/19/2003

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 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 Fisher 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 Fisher has been advised of the possibility of such damages.