






# Material Safety Data Sheet

HAZARD WARNINGS	RISK PHRASES	PROTECTIVE CLOTHING
   	<p><b>THIS MATERIAL IS TOXIC BY INHALATION.</b>  <b>Highly toxic compound, do not ingest or inhale. Avoid all contact with this material.</b>  <b>Corrosive to eyes and skin on contact.</b>  <b>Water-reactive. May ignite or generate flammable gas in the presence of moisture.</b>  <b>Environmental hazard.</b></p>	

## Section I. Chemical Product and Company Identification

Chemical Name	<b>Chlorosulfonic Acid</b>		
Catalog Number	C1788	Supplier	TCI America 9211 N. Harbortgate St. Portland OR 1-800-423-8616
Synonym	Chlorosulfuric Acid	<div style="border: 2px solid black; padding: 5px;"> <p>In case of Emergency Call <b>Chemtrec®</b>  <b>(800) 424-9300 (U.S.)</b>  <b>(703) 527-3887 (International)</b></p> </div>	
Chemical Formula	ClHO <sub>3</sub> S		
CAS Number	7790-94-5		

## Section II. Composition and Information on Ingredients

Chemical Name	CAS Number	Percent (%)	TLV/PEL	Toxicology Data
Chlorosulfonic Acid	7790-94-5	Min. 97.0 (T)	Not available.	Rat LC <sub>50</sub> (inhalation) 4779mg/m <sup>3</sup> Rat LD <sub>50</sub> (oral) 50mg/kg

## Section III. Hazards Identification

Acute Health Effects	<p>Toxic if ingested or inhaled. Avoid prolonged contact with this material. Overexposure may result in serious illness or death.</p> <p>Corrosive to skin, eyes, and respiratory system. Liquid or spray mist may produce tissue damage, particularly in mucous membranes of the eyes, mouth and respiratory tract. Skin contact may produce burns. Eye contact can result in corneal damage or blindness. Inhalation of the spray mist may produce severe irritation of respiratory tract, characterized by coughing, choking, or shortness of breath. Corrosive materials may cause serious injury if ingested.</p> <p>Follow safe industrial hygiene practices and always wear proper protective equipment when handling this compound.</p>
Chronic Health Effects	<p><b>CARCINOGENIC EFFECTS</b> : Not available.  <b>MUTAGENIC EFFECTS</b> : Not available.  <b>TERATOGENIC EFFECTS</b> : Not available.  <b>DEVELOPMENTAL TOXICITY</b>: Not available.</p> <p>Repeated or prolonged contact with spray mist may produce chronic eye irritation and severe skin irritation. Repeated or prolonged exposure to spray mist may produce respiratory tract irritation leading to frequent attacks of bronchial infection. Repeated exposure to an highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.</p>

## Section IV. First Aid Measures

Eye Contact	Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention.
Skin Contact	In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.
Inhalation	If the victim is not breathing, perform mouth-to-mouth resuscitation. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, oxygen can be administered. Seek medical attention if respiration problems do not improve.
Ingestion	DO NOT INDUCE VOMITING. Loosen tight clothing such as a collar, tie, belt or waistband. If the victim is not breathing, perform mouth-to-mouth resuscitation. Examine the lips and mouth to ascertain whether the tissues are damaged, a possible indication that the toxic material was ingested; the absence of such signs, however, is not conclusive.

## Section V. Fire and Explosion Data

Flammability	May be combustible at high temperature.	Auto-Ignition	Not available.
Flash Points	Not available.	Flammable Limits	Not available.
Combustion Products	These products include toxic sulfur oxides (SO <sub>x</sub> ), halogenated compounds. WARNING: Highly toxic HCl gas is produced during combustion.		
Fire Hazards	Not available.		

Continued on Next Page

Emergency phone number (800) 424-9300

Explosion Hazards	Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.
Fire Fighting Media and Instructions	DO NOT USE WATER. SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use alcohol foam, water spray or fog. Consult with local fire authorities before attempting large scale fire-fighting operations.


## Section VI. Accidental Release Measures

Spill Cleanup Instructions	Highly toxic material. Corrosive material. Water-reactive material. Environmentally hazardous material. Keep away from heat. Mechanical exhaust required. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. DO NOT get water inside container. DO NOT touch spilled material. Use water spray curtain to divert vapor drift. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Consult federal, state, and/or local authorities for assistance on disposal.
----------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

## Section VII. Handling and Storage

Handling and Storage Information	HIGHLY TOXIC. CORROSIVE. WATER-REACTIVE. ENVIRONMENTAL HAZARD. Keep locked up.. Keep under inert atmosphere. Keep container dry. Keep away from heat. Mechanical exhaust required. Keep away from direct sunlight or strong incandescent light. DO NOT ingest. Do not breathe gas/fumes/ vapor/spray. Never add water to this product. Avoid shock and friction. Wear suitable protective clothing. If ingested, seek medical advice immediately and show the container or the label. Treat symptomatically and supportively. Always store away from incompatible compounds such as oxidizing agents, metals, acids.
----------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

## Section VIII. Exposure Controls/Personal Protection

Engineering Controls	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash station and safety shower is proximal to the work-station location.
Personal Protection	Face shield. Lab coat. Vapor respirator. Boots. Gloves. A MSHA/NIOSH approved respirator must be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product. 
Exposure Limits	Not available.

## Section IX. Physical and Chemical Properties

Physical state @ 20°C	Liquid. (Colorless or slightly yellow.)	Solubility	Common solvents include: Liquid sulfur dioxide, pyridine, and dichloroethane.
Specific Gravity	1.745 (water=1)		
Molecular Weight	116.52	Partition Coefficient	Not available.
Boiling Point	151 to 152°C (303.8 to 305.6°F) @ 755mmHg	Vapor Pressure	0.1 kPa (@ 25°C)
Melting Point	-80°C (-112°F)	Vapor Density	4.02 (Air = 1)
Refractive Index	1.4331	Volatility	Not available.
Critical Temperature	Not available.	Odor	Pungent.
Viscosity	Not available.	Taste	Not available.

## Section X. Stability and Reactivity Data

Stability	This material is stable if stored under proper conditions. (See Section VII for instructions)
Conditions of Instability	Avoid excessive heat and light.
Incompatibilities	Reactive with strong oxidizing agents, metals, acids, alcohols, water. The product REACTS violently with water to emit FLAMMABLE BUT NON TOXIC GASES.

## Section XI. Toxicological Information

RTECS Number	FX5730000
Routes of Exposure	Eye Contact. Ingestion. Inhalation. Skin contact.
Toxicity Data	Rat LC <sub>50</sub> (inhalation) 4779mg/m <sup>3</sup> /4H Rat LD <sub>50</sub> (oral) 50mg/kg
Chronic Toxic Effects	<b>CARCINOGENIC EFFECTS</b> : Not available. <b>MUTAGENIC EFFECTS</b> : Not available. <b>TERATOGENIC EFFECTS</b> : Not available. <b>DEVELOPMENTAL TOXICITY</b> : Not available. Repeated or prolonged contact with spray mist may produce chronic eye irritation and severe skin irritation. Repeated or prolonged exposure to spray mist may produce respiratory tract irritation leading to frequent attacks of bronchial infection. Repeated exposure to an highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

Continued on Next Page

Emergency phone number (800) 424-9300

Acute Toxic Effects	Toxic if ingested or inhaled. Avoid prolonged contact with this material. Overexposure may result in serious illness or death. Corrosive to skin, eyes, and respiratory system. Liquid or spray mist may produce tissue damage, particularly in mucous membranes of the eyes, mouth and respiratory tract. Skin contact may produce burns. Eye contact can result in corneal damage or blindness. Inhalation of the spray mist may produce severe irritation of respiratory tract, characterized by coughing, choking, or shortness of breath. Corrosive materials may cause serious injury if ingested. Follow safe industrial hygiene practices and always wear proper protective equipment when handling this compound.
---------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------


## Section XII. Ecological Information

Ecotoxicity	Not available.
Environmental Fate	Chlorosulfonic acid may be released to the environment as a result of its manufacture and use as an intermediate in the synthesis of a variety of chemicals including detergents, pharmaceuticals, and pesticides. If chlorosulfonic acid is released to soil, it will be expected to rapidly hydrolyze if the soil is moist, based upon the reported violent hydrolysis by water giving hydrochloric and sulfuric acids. Since it rapidly hydrolyzes, biodegradation, adsorption to and volatilization from moist soil are not expected to be significant processes, although no data specifically regarding the fate of chlorosulfonic acid in soil were located. Based upon a measured vapor pressure of 0.75 mm Hg at 20 deg C, volatilization from dry near-surface soil or other surfaces may be significant processes. If released to water, it will be hydrolyzed violently by water producing hydrogen chloride and sulfuric acid. Based upon this rapid and violent hydrolysis, bioconcentration, biodegradation, volatilization, and adsorption to sediment and suspended solids are not expected to be significant processes. If chlorosulfonic acid is released to the atmosphere, it will be expected to exist almost entirely in the vapor phase based upon its vapor pressure. It may be susceptible to hydrolysis in moist air based upon its rapid hydrolysis in aqueous solution and the report that the chemical fumes in air. It will be susceptible to photooxidation via vapor phase reaction with photochemically produced hydroxyl radicals. An atmospheric half-life of 1.2 years at an atmospheric concentration of $5 \times 10^{-5}$ hydroxyl radicals per cu cm has been calculated for this process based upon an estimated rate constant. Exposure to chlorosulfonic acid will be primarily occupational via inhalation and possibly dermal contact. (HSDB)

## Section XIII. Disposal Considerations

Waste Disposal	Recycle to process, if possible. Consult your local regional authorities. You may be able to dissolve or mix material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber system. Observe all federal, state and local regulations when disposing of the substance.
----------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

## Section XIV. Transport Information

DOT Classification	<b>Forbidden to ship by Air</b> Class 8: Corrosive material. CLASS 6.1: Toxic material.
PIN Number	UN1754
Proper Shipping Name	Chlorosulfonic Acid
Packing Group (PG)	I (DOT: Zone B)
DOT Pictograms	

## Section XV. Other Regulatory Information and Pictograms

TSCA Chemical Inventory (EPA)	This compound is <b>ON</b> the EPA Toxic Substances Control Act (TSCA) inventory list.
WHMIS Classification (Canada)	CLASS D-1A: Material causing immediate and serious toxic effects (VERY TOXIC). CLASS E: Corrosive liquid. CLASS F: Dangerously reactive material. On DSL.
EINECS Number (EEC)	232-234-6
EEC Risk Statements	R14- Reacts violently with water. R35- Causes severe burns. R37- Irritating to respiratory system.
Japanese Regulatory Data	ENCS No. 1-222

## Section XVI. Other Information

Version 1.0  
Validated on 6/23/2006.  
Printed 6/23/2006.

### Notice to Reader

Continued on Next Page

Emergency phone number (800) 424-9300

TCI laboratory chemicals are for research purposes only and are NOT intended for use as drugs, food additives, households, or pesticides. The information herein is believed to be correct, but does not claim to be all inclusive and should be used only as a guide. Neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All chemical reagents must be handled with the recognition that their chemical, physiological, toxicological, and hazardous properties have not been fully investigated or determined. All chemical reagents should be handled only by individuals who are familiar with their potential hazards and who have been fully trained in proper safety, laboratory, and chemical handling procedures. Although certain hazards are described herein, we can not guarantee that these are the only hazards which exist. Our MSDS sheets are based only on data available at the time of shipping and are subject to change without notice as new information is obtained. Avoid long storage periods since the product is subject to degradation with age and may become more dangerous or hazardous. It is the responsibility of the user to request updated MSDS sheets for products that are stored for extended periods. Disposal of unused product must be undertaken by qualified personnel who are knowledgeable in all applicable regulations and follow all pertinent safety precautions including the use of appropriate protective equipment (e.g. protective goggles, protective clothing, breathing equipment, facial mask, fume hood). For proper handling and disposal, always comply with federal, state, and local regulations.