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SAFETY DATA SHEETS

According to the UN GHS revision 10

Version: 1.1
Creation Date: July 15, 2024
Revision Date: January 04, 2025

SECTION 1: Identification

1.1 GHS Product identifier

Product name Chlorosulfonic Acid

1.2 Other means of identification

Product number C1797542
Other names Chlorosulphuric acid;Sulfonic acid,monochloride;sulfonic chloride acid

1.3 Recommended use of the chemical and restrictions on use

Identified uses For laboratory and Industrial use only.
Uses advised against no data available

1.4 Supplier's details

Company CATO Research Chemicals Inc.
Address 3/F,Building B,No.179 BASIGO, Guangpu Rd East,Huangpu Dist,Guangzhou
Telephone +86-20-81960175

1.5 Emergency phone number

Emergency phone number +86-20-81960175
Service hours 'Monday to Friday, 9am-5pm (Standard time zone: UTC/GMT +8 hours).

SECTION 2: Hazard identification

2.1 Classification of the substance or mixture

Skin corrosion, Sub-category 1A
Specific target organ toxicity – single exposure, Category 3

2.2 GHS label elements, including precautionary statements

Pictogram(s)

Signal word Danger
Hazard statement(s) H314 Causes severe skin burns and eye damage
H335 May cause respiratory irritation

Precautionary statement(s)
Prevention P260 Do not breathe dust/fume/gas/mist/vapours/spray.
P264 Wash ... thoroughly after handling.
P280 Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...
P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
P271 Use only outdoors or in a well-ventilated area.
Response P301+P330+P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P363 Wash contaminated clothing before reuse.
P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P316 Get emergency medical help immediately.
P321 Specific treatment (see ... on this label).
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P319 Get medical help if you feel unwell.
Storage P405 Store locked up.
P403+P233 Store in a well-ventilated place. Keep container tightly closed.
Disposal P501 Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

2.3 Other hazards which do not result in classification

no data available

SECTION 3: Composition/information on ingredients

3.1 Substances

Chemical name	Common names and synonyms	CAS number	EC number	Concentration
Chlorosulfonic Acid	Chlorosulphuric acid	7790-94-5	232-234-6	≈ 99%

SECTION 4: First-aid measures

4.1 Description of necessary first-aid measures

If inhaled

Fresh air, rest. Half-upright position. Artificial respiration may be needed. Refer for medical attention.

Following skin contact

Remove contaminated clothes. Rinse skin with plenty of water or shower. Refer for medical attention .

Following eye contact

First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then refer for medical attention.

Following ingestion

Rinse mouth. Do NOT induce vomiting. Give one or two glasses of water to drink. Refer for medical attention .

4.2 Most important symptoms/effects, acute and delayed

INHALATION: vapor extremely irritating to lungs and mucous membranes. Vapor has such a sharp and pentrating odor that inhalation of severely toxic quantities is unlikely unless it is impossible to escape the fumes. CONTACT WITH EYES OR SKIN: liquid acid will severely burn body tissue. (USCG, 1999)

4.3 Indication of immediate medical attention and special treatment needed, if necessary

no data available

SECTION 5: Fire-fighting measures

5.1 Suitable extinguishing media

Use water spray, dry chemical, foam carbon dioxide. DO NOT allow water to make contact with material, as highly acidic run-off will be formed. Use water spray to keep fire-exposed containers cool. Closed containers may rupture violently when heated.

5.2 Specific hazards arising from the chemical

Special Hazards of Combustion Products: Decomposes into irritating and toxic gases Behavior in Fire: Although nonflammable, it may ignite other combustibles. Contact with water AND metal produces explosive hydrogen gas. (USCG, 1999)

5.3 Special protective actions for fire-fighters

In case of fire in the surroundings, use appropriate extinguishing media. In case of fire: keep drums, etc., cool by spraying with water. NO direct contact with water.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Evacuate danger area! Consult an expert! Personal protection: complete protective clothing including self-contained breathing apparatus. Ventilation. Collect leaking liquid in sealable containers. Cautiously neutralize remainder with alkaline materials, crushed limestone, sodium bicarbonate or soda ash. Then wash away with plenty of water. Do NOT absorb in saw-dust or other combustible absorbents.

6.2 Environmental precautions

Evacuate danger area! Consult an expert! Personal protection: complete protective clothing including self-contained breathing apparatus. Ventilation. Collect leaking liquid in sealable containers. Cautiously neutralize remainder with alkaline materials, crushed limestone, sodium bicarbonate or soda ash. Then wash away with plenty of water. Do NOT absorb in saw-dust or other combustible absorbents.

6.3 Methods and materials for containment and cleaning up

Spills of hazardous chemicals (such as inorganic sulfur acids, oleums of strength 35 to 65%, liquid sulfur trioxide, or chlorosulfonic acid) can be treated with high molecular weight polyacrylamide, polymethyl methacrylate or a blend of polyacrylamides. Each forms a polymer skin over the liquid surface, suppressing the fume & allowing access to the spill so that cleanup can be done in a controlled manner. Polyacrylamide variant DP 1916 is best treatment for chlorosulfonic acid & oleum 20. Polycarbonate granules used in a layer approx 80 mm thick topped off with Sorboil (an absorbent clay) is best treatment for diked spills of oleums of all strengths & liq sulfur trioxide. The acid beneath the skin is best recovered by pumping. Unconfined spills of sulfur trioxide & oleums of all strengths can be treated with excess anhydrous sodium sulfate which forms a concrete-like residue that can be sprayed with water within 1 hour, dissolving it slowly. Expanded perlite, if contained in degradable bags, will effectively absorb & contain sulfur acids. Fumes of oleum 65% arising from spillage of 80 to 750 kg can be killed within 4 to 13 min. Asphalt or concrete is slightly affected.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

NO contact with alcohol, combustible substances, reducing agents or water. Handling in a well ventilated place. Wear suitable protective clothing. Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Use non-sparking tools. Prevent fire caused by electrostatic discharge steam.

7.2 Conditions for safe storage, including any incompatibilities

Separated from food and feedstuffs. See Chemical Dangers. Dry. Well closed.KEEP TIGHTLY CLOSED.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure limit values

Component	Chlorosulphuric acid			
CAS No.	7790-94-5			
	Limit value - Eight hours		**Limit value - Short term**	
	ppm	**mg/m^3**	**ppm**	**mg/m^3**
Australia	0,209	1		
Ireland		1		
New Zealand		1		
United Kingdom		1		
	Remarks			

Biological limit values

no data available

8.2 Appropriate engineering controls

Ensure adequate ventilation. Handle in accordance with good industrial hygiene and safety practice. Set up emergency exits and the risk-elimination area.

8.3 Individual protection measures, such as personal protective equipment (PPE)

Eye/face protection

Wear face shield or eye protection in combination with breathing protection.

Skin protection

Protective gloves. Protective clothing.

Respiratory protection

Use ventilation, local exhaust or breathing protection.

Thermal hazards

no data available

SECTION 9: Physical and chemical properties and safety characteristics

Physical state	Chlorosulfonic acid is a colorless to yellow colored fuming liquid with a pungent odor. Density 14.7 lb / gal. Causes severe burns. Very toxic by inhalation. Corrosive to metals.
Colour	COLORLESS OR SLIGHTLY YELLOW LIQUID
Odour	PUNGENT
Melting point/freezing point	32°C(lit.)
Boiling point or initial boiling point and boiling range	151-152°C/755mmHg(lit.)
Flammability	Not combustible but enhances combustion of other substances. Many reactions may cause fire or explosion. Gives off irritating or toxic fumes (or gases) in a fire.
Lower and upper explosion limit/flammability limit	no data available
Flash point	126°C(lit.)
Auto-ignition temperature	Not flammable (USCG, 1999)
Decomposition temperature	no data available
pH	no data available
Kinematic viscosity	no data available
Solubility	/COMMON SOLVENTS INCLUDE/ LIQUID SULFUR DIOXIDE, PYRIDINE, & DICHLOROETHANE.
Partition coefficient n-octanol/water	no data available
Vapour pressure	1 mm Hg (25 °C)

Density and/or relative density	1.753g/mLat 25°C(lit.)
Relative vapour density	4 (vs air)
Particle characteristics	no data available

SECTION 10: Stability and reactivity

10.1 Reactivity

Decomposes on heating and on contact with water. This produces toxic and corrosive fumes. The substance is a strong oxidant. It reacts violently with combustible and reducing materials. The substance is a strong acid. It reacts violently with bases and is corrosive. Reacts violently with alcohols, powdered metals, phosphorus, nitrates and many other substances. This generates fire and explosion hazard.

10.2 Chemical stability

Fumes in air

10.3 Possibility of hazardous reactions

Not combustible, but if involved in a fire decomposes rapidly to produce hydrogen chloride, sulfur dioxide, sulfuric acid. Evolves hydrogen on contact with moist metals. Closed containers may rupture violently.CHLOROSULFONIC ACID is a strong oxidizing acid. Reacts violently with water, strong mineral acids and bases, alcohols, finely dispersed organic matter. Dangerously incompatible with combustible materials, nitrates, chlorates, metallic powders, carbides, picrates, and fulminates. Undergoes possibly violent reactions with acetic acid, acetic anhydride, acetonitrile, acrolein, acrylic acid, acrylonitrile, alkali, allyl alcohol, allyl chloride, ammonium hydroxide, aniline, butyraldehyde, cresol, cumene, diethyleneglycol methyl ether, diisopropyl ether, diphenyl ether, ethyl acetate, ethyl acrylate, ethylene chlorohydrin, ethylenediamine, ethylene glycol, glyoxal, hydrocarbons (hexane, heptane), hydrogen peroxide, isoprene, powdered metals, methyl ethyl ketone, propylene oxide, vinyl acetate. When heated to decomposition, it emits toxic fumes of hydrogen chloride and oxides of sulfur [Sax, 9th ed., 1996, p. 831]. Reaction with phosphorus accelerates out of control and culminates in an explosion [Heumann, K. et al., Ber., 1882, 15, p. 417]. Mixing chlorosulfuric acid and 98% sulfuric acid may evolve HCl [Subref: Anon, Loss Prev. Bull. 1977, (013), 2-3].

10.4 Conditions to avoid

no data available

10.5 Incompatible materials

Mixing chlorosulfonic acid with either 28% ammonia, creosote oil, 36% hydrochloric acid or 48.7% hydrofluoric acid, 70% nitric acid, 2-nitropropane or 96% sulfuric acid in a closed container caused the temperature & pressure to increase. It is dangerous in contact with combustible materials, nitrates, chlorates, metallic powders, carbides, picrates & fulminates.

10.6 Hazardous decomposition products

If involved in a fire decomposes rapidly to produce hydrogen chloride, sulfur dioxide, sulfuric acid.

SECTION 11: Toxicological information

Acute toxicity

- Oral: no data available
- Inhalation: no data available
- Dermal: no data available

Skin corrosion/irritation

no data available

Serious eye damage/irritation

no data available

Respiratory or skin sensitization

no data available

Germ cell mutagenicity

no data available

Carcinogenicity

no data available

Reproductive toxicity

no data available

STOT-single exposure

The substance is very corrosive to the eyes, skin and respiratory tract. Corrosive on ingestion. Inhalation of the vapour may cause lung oedema. See Notes. The effects may be delayed. Medical observation is indicated.

STOT-repeated exposure

Repeated or prolonged inhalation may cause effects on the lungs. The substance may have effects on the teeth. This may result in erosion.

Aspiration hazard

A harmful contamination of the air can be reached rather quickly on evaporation of this substance at 20°C.

SECTION 12: Ecological information

12.1 Toxicity

- Toxicity to fish: no data available
- Toxicity to daphnia and other aquatic invertebrates: no data available
- Toxicity to algae: no data available
- Toxicity to microorganisms: no data available

12.2 Persistence and degradability

No data were located concerning the biodegradation of chlorosulfonic acid either in natural systems or in laboratory studies(SRC). Since chlorosulfonic acid is violently hydrolyzed in water(1), biodegradation is not expected to be a significant process(SRC).

12.3 Bioaccumulative potential

Since chlorosulfonic acid is violently hydrolyzed in water(1), bioconcentration in aquatic organisms is not expected to be a significant process(SRC).

12.4 Mobility in soil

Since chlorosulfonic acid is violently hydrolyzed in water(1), adsorption to soil is not expected to be a significant process(SRC).

12.5 Other adverse effects

no data available

SECTION 13: Disposal considerations

13.1 Disposal methods

Product

The material can be disposed of by removal to a licensed chemical destruction plant or by controlled incineration with flue gas scrubbing. Do not contaminate water, foodstuffs, feed or seed by storage or disposal. Do not discharge to sewer systems.

Contaminated packaging

Containers can be triply rinsed (or equivalent) and offered for recycling or reconditioning. Alternatively, the packaging can be punctured to make it unusable for other purposes and then be disposed of in a sanitary landfill. Controlled incineration with flue gas scrubbing is possible for combustible packaging materials.

SECTION 14: Transport information

14.1 UN Number

ADR/RID: UN1754 (For reference only, please check.) IMDG: UN1754 (For reference only, please check.) IATA: UN1754 (For reference only, please check.)

14.2 UN Proper Shipping Name

ADR/RID: CHLOROSULPHONIC ACID (with or without sulphur trioxide) (For reference only, please check.) IMDG: CHLOROSULPHONIC ACID (with or without sulphur trioxide) (For reference only, please check.) IATA: CHLOROSULPHONIC ACID (with or without sulphur trioxide) (For reference only, please check.)

14.3 Transport hazard class(es)

ADR/RID: 8 (For reference only, please check.) IMDG: 8 (For reference only, please check.) IATA: 8 (For reference only, please check.)

14.4 Packing group, if applicable

ADR/RID: I (For reference only, please check.) IMDG: I (For reference only, please check.) IATA: I (For reference only, please check.)

14.5 Environmental hazards

ADR/RID: No IMDG: No IATA: No

14.6 Special precautions for user

no data available

14.7 Transport in bulk according to IMO instruments

no data available

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations specific for the product in question

Chemical name	Common names and synonyms	CAS number	EC number
Chlorosulphuric acid	Chlorosulphuric acid	7790-94-5	232-234-6
European Inventory of Existing Commercial Chemical Substances (EINECS)			Listed.

EC Inventory	Listed.
United States Toxic Substances Control Act (TSCA) Inventory	Listed.
China Catalog of Hazardous chemicals 2015	Listed.
New Zealand Inventory of Chemicals (NZIoC)	Listed.
Philippines Inventory of Chemicals and Chemical Substances (PICCS)	Listed.
Vietnam National Chemical Inventory	Listed.
Chinese Chemical Inventory of Existing Chemical Substances (China IECSC)	Listed.
Korea Existing Chemicals List (KECL)	Listed.

SECTION 16: Other information

Information on revision

Creation Date	July 15, 2024
Revision Date	January 04, 2025

Abbreviations and acronyms

- CAS: Chemical Abstracts Service
- ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road
- RID: Regulation concerning the International Carriage of Dangerous Goods by Rail
- IMDG: International Maritime Dangerous Goods
- IATA: International Air Transportation Association
- TWA: Time Weighted Average
- STEL: Short term exposure limit
- LC50: Lethal Concentration 50%
- LD50: Lethal Dose 50%
- EC50: Effective Concentration 50%

References

- IPCS - The International Chemical Safety Cards (ICSC), website: http://www.ilo.org/dyn/icsc/showcard.home
- HSDB - Hazardous Substances Data Bank, website: https://toxnet.nlm.nih.gov/newtoxnet/hsdb.htm
- IARC - International Agency for Research on Cancer, website: http://www.iarc.fr/
- eChemPortal - The Global Portal to Information on Chemical Substances by OECD, website: http://www.echemportal.org/echemportal/index?pageID=0&request_locale=en
- CAMEO Chemicals, website: http://cameochemicals.noaa.gov/search/simple
- ChemIDplus, website: http://chem.sis.nlm.nih.gov/chemidplus/chemidlite.jsp
- ERG - Emergency Response Guidebook by U.S. Department of Transportation, website: http://www.phmsa.dot.gov/hazmat/library/erg
- Germany GESTIS-database on hazard substance, website: http://www.dguv.de/ifa/gestis/gestis-stoffdatenbank/index-2.jsp
- ECHA - European Chemicals Agency, website: https://echa.europa.eu/

Other Information

Reacts violently with fire extinguishing agents such as water.The symptoms of lung oedema often do not become manifest until a few hours have passed and they are aggravated by physical effort.Rest and medical observation is therefore essential.Depending on the degree of exposure, periodic medical examination is suggested.

Any questions regarding this SDS, Please send your inquiry to info@cato-chem.com

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