MATERIAL SAFETY DATA SHEET (MSDS)

SECTION 1: Identification

1.1 Product identifiers

Product Name : **Chlorosulfonic acid**

Cat No.: **AC304490000; AC304490010; AC304490025; AC304490250; AC304491000; AC304495000**

CAS No. : 7790-94-5

1.2 Relevant identified uses of the substance or mixture and uses advised against

Recommended uses : Laboratory chemicals

Uses advised against: Food, drug, pesticide or biocidal product use.

1.3 Details of the supplier of the safety data sheet

Company : Krishna Solvechem Limited.
B/503, Sahayog, S. V. Road,
Kandivali (West), Mumbai – 400067. India.

Telephone : +91-22-6123 0222

Email : exports@kscl.co.in

1.4 Emergency telephone number

Emergency Phone : +91-8657457330

SECTION 2: Hazards identification

2.1 Classification

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Skin Corrosion/Irritation	(Category 1 A)
Serious Eye Damage/Eye Irritation	(Category 1)
Specific target organ toxicity (single exposure)	(Category 3)
Target Organs - Respiratory system.	

2.2 Label elements

Pictogram :

Signal word Danger

Hazard statement (s) Causes severe skin burns and eye damage

	May cause respiratory irritation
Precautionary statement (s)	
Prevention	
	Wash face, hands and any exposed skin thoroughly after handling Wear protective gloves/protective clothing/eye protection/face protection Avoid breathing dust/fume/gas/mist/vapors/spray Use only outdoors or in a well-ventilated area
	Inhalation : IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing Call a POISON CENTER or doctor/physician if you feel unwell
	IF ON SKIN (or hair): If skin irritation occurs: Get medical advice/attention IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower Wash contaminated clothing before reuse
	Eyes: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing If eye irritation persists: Get medical advice/attention
	Ingestion: IF SWALLOWED: Rinse mouth. DO NOT induce vomiting
	Storage: Store locked up Store in a well-ventilated place. Keep container tightly closed
	Disposal: Dispose of contents/container to an approved waste disposal plant
Hazards not otherwise classified (HNOC)	None identified

SECTION 3: Composition / information on ingredients

3.1

Component	CAS-No	Weight %
1-Bromo-2-methylpropane (By GC)	78-77-3	98% Minimum

SECTION 4: First aid measures

4.1	**Description of first aid measures**	
	General Advice:	If symptoms persist, call a physician.
	If inhalation :	Remove from exposure, lie down. If breathing is difficult, give oxygen. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respirationwith the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Call a physician immediately.
	In case of skin contact :	Wash off immediately with plenty of water for at least 15 minutes. If skin irritation persists, call a physician.
	In case of eye contact :	Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Get medical attention.
	Ingestion :	Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Call aphysician immediately. Clean mouth with water.
4.2	**Most important symptoms and effects :**	Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting
4.3	**Notes to Physician :**	Treat symptomatically

SECTION 5: Firefighting effects

5.1	**Extinguishing media**	
	Suitable extinguishing media :	Carbon dioxide (CO2), dry chemical, alcohol-resistant foam.
	Unsuitable Extinguishing Media: :	No information available
5.2	**Flash Point :**	No information available
	Method :	No information available

	Autoignition Temperature:	No information available
	Explosion Limits:	
	Upper	37.70%
	Lower	3.30%
	Sensitivity to Mechanical Impact	No information available
	Sensitivity to Static Discharge	No information available
	Specific Hazards Arising from the Chemical :	Thermal decomposition can lead to release of irritating gases and vapors. The product causes burns of eyes, skin and mucous membranes. Reacts violently with water.
	Hazardous Combustion Products :	Carbon monoxide (CO). Carbon dioxide (CO2). Sulfur oxides

5.4 Protective Equipment and Precautions for Firefighters: As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

NFPA:

Health	Flammability	Instability	Physical hazards
4	0	2	W

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak. Use personal protective equipment as required. Ensure adequate ventilation.

6.2 Environmental precautions

Should not be released into the environment. See section 12 for additional Ecological Information

6.3 Methods and materials for containment and cleaning up

Keep in suitable, closed containers for disposal. Soak up with inert absorbent material. Do not expose spill to water.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Do not get in eyes, on skin, or on clothing. Do not ingest. If swallowed then seek immediate medical assistance. Use only under a chemical fume hood. Wear personal protective equipment/face protection. Do not breathe mist/vapors/spray. Do not allow contact withwater.

7.2	Conditions for safe storage
	Corrosives area. Keep containers tightly closed in a dry, cool and well-ventilated place.Keep away from water or moist air. Incompatible Materials. Acids. Bases. Alcohols. Amines. Butyl rubber. Finely powdered metals.

SECTION 8: Exposure controls/personal protection

8.1 Exposure Guidelines

This product does not contain any hazardous materials with occupational exposure limits established by the region specific regulatory bodies.

Engineering Measures

Ensure that eyewash stationsand safety showers are close to the workstation location. Ensure adequate ventilation, especially in confined areas.

8.2 Exposure controls

Personal protective equipment -

Eye / Face protection

Tight sealing safety goggles. Face protection shield.

Skin protection and body protection

Wear appropriate protective gloves and clothing to prevent skin exposure.

Respiratory protection

Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European StandardEN 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.

Hygiene Measures

Handle in accordance with good industrial hygiene and safety practice..

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

a) Appearance	Form: Liquid
b) Odour	Pungent
c) Odour Threshold	No information available
d) pH	<1
e) Melting point / freezing point	-80 °C / -112 °F
f) Initial boiling point and	151 - 152 °C / 303.8 - 305.6 °F @ 760 mmHg

boiling range	
g) Flash point	No information available
h) Evaporation rate	No information available
i) Flammability (solid, gas)	Not applicable
j) Upper/lower flammability or explosive limits	37.70% 3.30%
k) Vapour pressure	No information available
l) Vapour density	4
m) Specific Gravity	1.750
n) Solubility	Reacts violently with water
o) Partition coefficient: n octanol/water	No data available
p) Auto-ignition temperature	No information available
q) Decomposition temperature	> 151°C
r) Viscosity	3 mPa.s at 95 °C
s) Molecular formula	H Cl O3 S
t) Molecular Weight	116.52

SECTION 10: Stability and Reactivity

10.1	**Reactive Hazard :**	Yes
10.2	**Chemical stability :**	Moisture sensitive
10.3	**Possibility of hazardous reactions :**	None under normal processing. Reacts violently with water
10.4	**Conditions to avoid :**	Excess heat. Exposure to moisture. Exposure to moist air or water. Incompatible products.
10.5	**Incompatible materials:**	Acids, Bases, Alcohols, Amines, Butyl rubber, Finely powdered metals
10.6	**Hazardous decomposition products :**	Carbon monoxide (CO), Carbon dioxide (CO2), Sulfur oxides
10.7	**Hazardous Polymerization**	Hazardous polymerization does not occur

SECTION 11: Toxicological information

11.1
Information on toxicological effects

Acute toxicity:

Product Information: No acute toxicity information is available for this product

Component Information

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
Chlorosulfonic acid	-	Not listed	LC50 = 0.0385 mg/L (Rat) 4 h

Toxicologically Synergistic Products No information available

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Irritation : No information available

Sensitization: No information available

Carcinogenicity : The table below indicates whether each agency ha Any ingredient as a carcinogen.

Component	CAS-No	IARC	NTP	ACGIH	OSHA	Mexico
Chlorosulfonic acid	7790-94-5	Not listed	Not listed	Not listed	Not listed	Not listed

Mutagenic Effects: No information available.

Reproductive Effects: No information available.

Developmental Effects : No information available.

Teratogenicity: No information available.

STOT - single exposure : Respiratory system

STOT - repeated exposure: None known

Aspiration hazard : No information available.

Symptoms / effects,both acute and delayed: Product is a corrosive material. Use of gastric lavage or emesis is contraindicated. Possible perforation of stomach or esophagus should be investigated: Ingestion causessevere swelling, severe damage to the delicate tissue and danger of perforation

Endocrine Disruptor Information : No information available

Other Adverse Effects : See actual entry in RTECS for complete information

SECTION 12: Ecological information

12.1
Ecotoxicity:
Do not empty into drains. Reacts with water so no ecotoxicity data for the substance is available.

Component	Freshwater Algae	Freshwater Fish	Microtox	Water Flea
Chlorosulfonic acid	Not listed	LC50 = 5740 mg/L 96h	Not listed	EC50 = 32 mg/L 48h

12.2 Persistence and degradability: Persistence is unlikely based on information Available.

Bioaccumulation/ Accumulation No information available

12.3 Mobility: Is not likely mobile in the environment

SECTION 13: Disposal considerations

13.1 Waste treatment methods: Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification.

SECTION 14: Transport information

14.1 UN number :
DOT : UN1754 TDG : UN1754
IATA : UN1754 IMDG : UN1754

14.2 UN proper shipping name

DOT : CHLOROSULFONIC ACID

TDG : CHLOROSULFONIC ACID

IMDG : CHLOROSULFONIC ACID

IATA : CHLOROSULFONIC ACID

14.3 Transport hazard class(es) DOT: 8 TDG: 8 IMDG: 8 IATA: 8

14.4 Packaging group: DOT: I TDG: I IMDG: I IATA: I

SECTION 15: Regulatory information

15.1 United states of America Inventory:

Component	CAS-No	TSCA	TSCA Inventory notification Active/Inactive	TSCA - EPA Regulatory Flags
Chlorosulfonic acid	7790-94-5	X	ACTIVE	-

Legend:

TSCA - Toxic Substances Control Act, (40 CFR Part 710)
X - Listed
'-' - Not Listed
TSCA 12(b) - Notices of Export Not applicable

International Inventories:
Canada (DSL/NDSL), Europe (EINECS/ELINCS/NLP), Philippines (PICCS), Japan (ENCS), Japan(ISHL), Australia(AICS), China (IECSC), Korea (ECL).

Component	CAS-No	DSL	NDSL	EINECS	PICCS	ENCS	ISHL	AICS	IECSC	KECL
Chloro sulfonic acid	7790 -94-5	X	-	232-234-6	X	X	X	X	X	KE-05909

U.S. Federal Regulations

SARA 313 Not applicable
SARA 311/312 Hazard Categories See section 2 for more information
CWA (Clean Water Act)

Component	CWA - Hazardous Substances	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants
Chlorosulfonic acid	X	1000 lb	-	-

Clean Air Act Not applicable
OSHA - Occupational Safety and Health Administration Not applicable
CERCLA This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and LiabilityAct (CERCLA) (40 CFR 302)

Component	Hazardous Substances RQs	CERCLA EHS RQs
Chloro sulfonic acid	1000 lb	-

California Proposition 65 This product does not contain any Proposition 65 chemicals.

15.2 U.S. State Right-to-Know Regulations:

Component	Massachusetts	New Jersey	Pennsylvania	Illinois	Rhode Island
Chlorosulfonic acid	X	X	X	-	X

U.S. Department of Transportation
Reportable Quantity (RQ): Y

DOT Marine Pollutant N
DOT Severe Marine Pollutant N

U.S. Department of Homeland Security - This product contains the following DHS Chemicals.

Component	DHS Chemical Facility Anti-Terrorism Standard
Chlorosulfonic acid	APA

Other International Regulations

Mexico – Grade No information available

Safety, health and environmental regulations/legislation specific for the substance or mixture

Component	CAS No	OECD HPV	Persistent Organic Pollutant	Ozone Depletion Potential	Restriction of Hazardous Substances (RoHS)
Chloro sulfonic acid	7790-94-5	Listed	Not applicable	Not applicable	Not applicable

Component	CAS No	Seveso III Directive (2012/18/EC) - Qualifying Quantitiesfor Major Accident Notification	Seveso III Directive (2012/18/EC) - Qualifying Quantitiesfor Safety Report Requirements	Rotterdam Convention (PIC)	Basel Convention (Hazardous Waste)
Chloro sulfonic acid	7790-94-5	Not applicable	Not applicable	Not applicable	Not applicable

SECTION 16: Other information

16.1 Prepared By: Regulatory affairs
Krishna Solvechem Limited
Email: exports@kscl.co.in
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Revision Summary: This document has been updated to comply with the US OSHA HazCom 2012 Standard replacing the current legislation under29 C F R 1910.1200 to align with the Globally Harmonized System ofClassification and Labeling of Chemicals (GHS).

16.2 Disclaimer:

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.