

Chemical Safety Data Sheet MSDS / SDS

1-chloro-2,3-epoxypropane SDS

Revision Date:2024-04-25 Revision Number:1

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SECTION 1: Identification of the substance/mixture and of the company/undertaking**Product identifier**

Product name: 1-chloro-2,3-epoxypropane

CAS: 106-89-8

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

Relevant identified uses: For R&D use only. Not for medicinal, household or other use.

Uses advised against: none

Company Identification

Company: Chemicalbook.in

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SECTION 2: Hazards identification**Classification of the substance or mixture**

Flammable liquids, Category 3

Acute toxicity - Category 3, Oral

Acute toxicity - Category 3, Dermal
Skin corrosion, Sub-category 1B
Skin sensitization, Category 1
Acute toxicity - Category 3, Inhalation
Carcinogenicity, Category 1B

GHS label elements, including precautionary statements

Pictogram(s)



Signal word

Danger

Hazard statement(s)

H226 Flammable liquid and vapour
H301 Toxic if swallowed
H311 Toxic in contact with skin
H314 Causes severe skin burns and eye damage
H317 May cause an allergic skin reaction
H331 Toxic if inhaled
H350 May cause cancer

Precautionary statement(s)

Prevention

P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233 Keep container tightly closed.
P240 Ground and bond container and receiving equipment.
P241 Use explosion-proof [electrical/ventilating/lighting/...] equipment.
P242 Use non-sparking tools.
P243 Take action to prevent static discharges.
P280 Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...
P264 Wash ... thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P260 Do not breathe dust/fume/gas/mist/vapours/spray.
P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
P272 Contaminated work clothing should not be allowed out of the workplace.
P271 Use only outdoors or in a well-ventilated area.
P203 Obtain, read and follow all safety instructions before use.

Response

P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse affected areas with water [or shower].

P370+P378 In case of fire: Use ... to extinguish.

P301+P316 IF SWALLOWED: Get emergency medical help immediately.

P321 Specific treatment (see ... on this label).

P330 Rinse mouth.

P302+P352 IF ON SKIN: Wash with plenty of water/...

P316 Get emergency medical help immediately.

P361+P364 Take off immediately all contaminated clothing and wash it before reuse.

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.

P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do.

Continue rinsing.

P333+P317 If skin irritation or rash occurs: Get medical help.

P362+P364 Take off contaminated clothing and wash it before reuse.

P318 IF exposed or concerned, get medical advice.

Storage

P403+P235 Store in a well-ventilated place. Keep cool.

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.

Other hazards which do not result in classification

no data available

SECTION 3: Composition/information on ingredients

Substance

Chemical name: 1-chloro-2,3-epoxypropane

Common names and synonyms: 1-chloro-2,3-epoxypropane

CAS number: 106-89-8
EC number: 203-439-8
Concentration: 100%

SECTION 4: First aid measures

Description of necessary first-aid measures

If inhaled

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

Following skin contact

Wear protective gloves when administering first aid. First rinse with plenty of water for at least 15 minutes, then remove contaminated clothes and rinse again. Put clothes in sealable container. Refer immediately for medical attention.

Following eye contact

Rinse with plenty of water (remove contact lenses if easily possible). Refer immediately for medical attention.

Following ingestion

Rinse mouth. Do NOT induce vomiting. Refer immediately for medical attention.

Most important symptoms/effects, acute and delayed

This compound is caustic as both a liquid and gas. Irritation of the eyes and skin, and skin sensitization has been observed. Exposure to epichlorohydrin has caused inflammation of the lungs, asthmatic bronchitis, and liver and kidney damage. In acute poisonings, death may be caused by respiratory paralysis. (EPA, 1998)

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

Acetylcysteine was useful in treating the toxic symptoms in rats resulting from inhalation of epichlorohydrin. srp: clinical effectiveness not proven

SECTION 5: Firefighting measures

Suitable extinguishing media

Avoid use of dry chemical if fire occurs in container with confined vent. Containers may explode in fire because of polymerization.

Specific hazards arising from the chemical

When heated to decomposition, this compound evolves highly toxic fumes of phosgene and carbon monoxide. Reactive and incompatible with strong oxidizers, strong acids, caustics, zinc, aluminum, chlorides of iron and aluminum and compounds with an active hydrogen atom, including water. Unstable, avoid heat, contaminants, strong acids and bases, certain curing agents such as ethylenediamine. Hazardous polymerization may occur. (EPA, 1998)

Special protective actions for fire-fighters

Use water spray, powder, foam, carbon dioxide. In case of fire: keep drums, etc., cool by spraying with water.

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures

Evacuate danger area! Consult an expert! Personal protection: chemical protection suit including self-contained breathing apparatus. Do NOT let this chemical enter the environment. Do NOT wash away into sewer. Collect leaking and spilled liquid in sealable containers as far as possible. Absorb remaining liquid in sand or inert absorbent. Then store and dispose of according to local regulations.

Environmental precautions

Evacuate danger area! Consult an expert! Personal protection: chemical protection suit including self-contained breathing apparatus. Do NOT let this chemical enter the environment. Do NOT wash away into sewer. Collect leaking and spilled liquid in sealable containers as far as possible. Absorb remaining liquid in sand or inert absorbent. Then store and dispose of according to local regulations.

Methods and materials for containment and cleaning up

Remove all ignition sources. Ventilate area of spill or leak.

SECTION 7: Handling and storage

Precautions for safe handling

NO open flames, NO sparks and NO smoking. Above 31°C use a closed system, ventilation and explosion-proof electrical equipment.

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.

Conditions for safe storage, including any incompatibilities

Fireproof. Separated from strong oxidants, acids, bases, aluminium, zinc, amines and food and feedstuffs. Well closed. Separate from acids, alkalies, salts, water, and oxidizers. Store in a cool, dry, well-ventilated location. Inside storage should be in a standard flammable liquids storage warehouse, room, or cabinet.

SECTION 8: Exposure controls/personal protection

Control parameters

Occupational Exposure limit values

TLV: 0.5 ppm as TWA; (skin); A3 (confirmed animal carcinogen with unknown relevance to humans).MAK: skin absorption (H); sensitization of skin (SH); carcinogen category: 2; germ cell mutagen group: 3B

Biological limit values

no data available

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.

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:	Liquid.
Colour:	Colorless.
Odour:	Odor is sweet, pungent or chloroform-like ... generally perceived as a slightly irritating chloroformlike odor
Melting point/freezing point:	-57.1 °C. Atm. press.:1 atm.;-57.2°C. Atm. press.:1 atm.
Boiling point or initial boiling point and boiling range:	117 °C. Atm. press.:1 013 hPa. Remarks:Critical study for SIDS endpoint.
Flammability:	Class IC Flammable Liquid: Fl.P. at or above 73°F and below 100°F.
Lower and upper explosion limit/flammability limit:	Lower flammable limit: 3.8% and upper flammable limit: 21.0%.
Flash point:	40 °C. Atm. press.:1 atm.
Auto-ignition temperature:	385 °C. Atm. press.:1 atm.
Decomposition temperature:	no data available
pH:	no data available
Kinematic viscosity:	dynamic viscosity (in mPa s) = 1.073. Temperature:25°C. Remarks:Experimental/predicted.
Solubility:	50 to 100 mg/mL at 72° F (NTP, 1992)
Partition coefficient n-octanol/water:	log Pow = 0.45. Temperature:25 °C.

Vapour pressure:	22.8 hPa. Temperature:25 °C. Remarks:Using the Antoine equation and these coefficients, the vapor pressure at 25 deg C was calculated to be 17.1 mmHg (22.8 hPa).
Density and/or relative density:	1.18. Temperature:20 °C.
Relative vapour density:	3.29 (EPA, 1998) (Relative to Air)
Particle characteristics:	no data available

SECTION 10: Stability and reactivity

Reactivity

NIOSH has recommended that epichlorohydrin be treated as a potential occupational carcinogen. The substance polymerizes due to heating or under the influence of strong acids and bases. On combustion, forms toxic and corrosive fumes of hydrogen chloride (see ICSC 0163) and chlorine (see ICSC 0126). Reacts violently with strong oxidants. Reacts violently with aluminium, zinc, alcohols, phenols, amines (especially aniline) and organic acids. This generates fire and explosion hazard. Attacks steel in the presence of water.

Chemical stability

Epichlorohydrin can be oxidized by free radical process in liquid or gas phases; these reactions may occur as photochemically initiated atmospheric reactions.

Possibility of hazardous reactions

Flammable liquid when exposed to heat or flame. 1-CHLORO-2,3-EPOXYPROPANE may polymerize exothermically if heated or contaminated. Reacts explosively with aniline. Ignites on contact with potassium tert-butoxide. Reacts with trichloroethylene to give the explosive dichloroacetylene. Violent reaction with sulfuric acid or isopropylamine. Exothermic polymerization on contact with strong acids or bases, zinc, aluminum, aluminum chloride, iron, ferric chloride [Sax, 9th ed., 1996, p. 1469].

Conditions to avoid

no data available

Incompatible materials

Strong oxidizers, strong acids, certain salts, caustics, zinc, aluminum, water [Note: May polymerize in presence of strong acids and

bases particularly when hot.].

Hazardous decomposition products

When heated to decomp, emits toxic fumes of /hydrogen chloride/.

SECTION 11: Toxicological information

Acute toxicity

Oral: LD50 Guinea pig oral 178 mg/kg

Inhalation: LC50 Rat inhalation 250 ppm/8 hr

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

Cancer Classification: Group B2 Probable Human Carcinogen

Reproductive toxicity

In humans occupationally exposed to epichlorohydrin, effects on sperm counts, hormone levels, and fertility have been not detected. Epichlorohydrin has been demonstrated to reduce fertility in male rats when inhaled or administered orally. (-) Teratogenic effects (birth defects) have not been observed in studies of rodents exposed by inhalation or ingestion.

STOT-single exposure

The substance is corrosive to the eyes, skin and respiratory tract. Corrosive on ingestion. Inhalation of the vapour may cause lung oedema. The effects may be delayed. Medical observation is indicated. See Notes. Inhalation of the vapour may cause asthma-like reactions. The substance may cause effects on the central nervous system, kidneys and liver. This may result in convulsions, kidney impairment and liver impairment. Exposure at high levels could cause death.

STOT-repeated exposure

Repeated or prolonged contact may cause skin sensitization. The substance may have effects on the kidneys, liver and lungs. This may result in impaired functions. May cause heritable genetic damage to human germ cells. This substance is probably carcinogenic to humans.

Aspiration hazard

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

SECTION 12: Ecological information

Toxicity

Toxicity to fish: LC50 - *Pimephales promelas* - 12.7 mg/L - 96 h.

Toxicity to daphnia and other aquatic invertebrates: EC50 - *Daphnia magna* - 23.9 mg/L - 48 h.

Toxicity to algae: EC50 - *Pseudokirchneriella subcapitata* (previous names: *Raphidocelis subcapitata*, *Selenastrum capricornutum*) - 7.1 mg/L - 72 h.

Toxicity to microorganisms: Toxicity threshold - *Entosiphon sulcatum* - 35 mg/L - 72 h. Remarks: Cell count.

Persistence and degradability

AEROBIC: An unspecified amount of epichlorohydrin reached 18% of its theoretical BOD in 1 week using an activated sludge inoculum and the Japanese MITI test(1). Pure cultures were able to biodegrade epichlorohydrin rapidly to 3-chloro-1,2-propanediol(2). Epichlorohydrin achieved 3% of the theoretical BOD in a sewage sludge over a 5 day incubation period, but achieved 14% of the theoretical BOD following acclimation(3). Epichlorohydrin was 67% biodegraded in an activated sludge degradability test following a 1 day acclimation period(4).

Bioaccumulative potential

An estimated BCF of 3 was calculated for epichlorohydrin(SRC), using a log Kow of 0.45(1) and a regression-derived equation(2). According to a classification scheme(3), this BCF suggests the potential for bioconcentration in aquatic organisms is low.

Mobility in soil

The Koc of epichlorohydrin is estimated as 40(SRC), using a log Kow of 0.45(1) and a regression-derived equation(2). According to a classification scheme(3), this estimated Koc value suggests that epichlorohydrin is expected to have very high mobility in soil(SRC).

Other adverse effects

no data available

SECTION 13: Disposal considerations

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

UN Number

ADR/RID: UN2023 (For reference only, please check.)

IMDG: UN2023 (For reference only, please check.)

IATA: UN2023 (For reference only, please check.)

UN Proper Shipping Name

ADR/RID: EPICHLOROHYDRIN (For reference only, please check.)

IMDG: EPICHLOROHYDRIN (For reference only, please check.)

IATA: EPICHLOROHYDRIN (For reference only, please check.)

Transport hazard class(es)

ADR/RID: 6.1 (For reference only, please check.)

IMDG: 6.1 (For reference only, please check.)

IATA: 6.1 (For reference only, please check.)

Packing group, if applicable

ADR/RID: II (For reference only, please check.)

IMDG: II (For reference only, please check.)

IATA: II (For reference only, please check.)

Environmental hazards

ADR/RID: No

IMDG: No

IATA: No

Special precautions for user

no data available

Transport in bulk according to IMO instruments

no data available

SECTION 15: Regulatory information

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

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.

(PICCS)

Listed.

Vietnam National Chemical Inventory

Listed.

IECSC)

Listed.

Korea Existing Chemicals List (KECL)

Listed.

SECTION 16: Other information

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

Other melting points: -25.6 °C and -57°C. Depending on the degree of exposure, periodic medical examination is suggested. 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 are therefore essential. Immediate administration of an appropriate inhalation therapy by a doctor, or by an authorized person, should be considered. The odour warning when the exposure limit value is exceeded is insufficient. Do NOT take working clothes home.

Disclaimer: The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. We as supplier shall not be held liable for any