

## Chemical Safety Data Sheet MSDS / SDS

## Bis(2-chloroethyl) ether 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: Bis(2-chloroethyl) ether

CAS: 111-44-4

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

Relevant identified uses: For R&amp;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**

Acute toxicity - Category 2, Oral

Acute toxicity - Category 1, Dermal

Acute toxicity - Category 2, Inhalation  
Carcinogenicity, Category 2

### GHS label elements, including precautionary statements

Pictogram(s)



Signal word

Danger

### Hazard statement(s)

H300 Fatal if swallowed  
H310 Fatal in contact with skin  
H330 Fatal if inhaled  
H351 Suspected of causing cancer

### Precautionary statement(s)

### Prevention

P264 Wash ... thoroughly after handling.  
P270 Do not eat, drink or smoke when using this product.  
P262 Do not get in eyes, on skin, or on clothing.  
P280 Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...  
P260 Do not breathe dust/fume/gas/mist/vapours/spray.  
P271 Use only outdoors or in a well-ventilated area.  
P284 [In case of inadequate ventilation] wear respiratory protection.  
P203 Obtain, read and follow all safety instructions before use.

### Response

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.  
P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.  
P320 Specific treatment is urgent (see ... on this label).  
P318 IF exposed or concerned, get medical advice.

### 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.

### Other hazards which do not result in classification

no data available

## SECTION 3: Composition/information on ingredients

### Substance

Chemical name: Bis(2-chloroethyl) ether

Common names and synonyms: Bis(2-chloroethyl) ether

CAS number: 111-44-4

EC number: 203-870-1

Concentration: 100%

## SECTION 4: First aid measures

### Description of necessary first-aid measures

#### If inhaled

Fresh air, rest. Half-upright position. Refer for medical attention.

#### Following skin contact

Remove contaminated clothes. Rinse and then wash skin with water and soap. 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. Induce vomiting (ONLY IN CONSCIOUS PERSONS!). Rest. Refer for medical attention .

### **Most important symptoms/effects, acute and delayed**

This material is very toxic; the probable oral lethal dose is 50-500 mg/kg, or between 1 teaspoonful and 1 ounce for a 150 pound person. It can be a central nervous system depressant in high concentrations. It is extremely irritating to the eyes, nose, and respiratory passages. It can penetrate the skin to cause serious and even fatal poisoning. Poisonous; may be fatal if inhaled, swallowed or absorbed through skin. (EPA, 1998)

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

Basic treatment: Establish a patent airway. Suction if necessary. Watch for signs of respiratory insufficiency and assist ventilations if necessary. Administer oxygen by nonrebreather mask at 10 to 15 L/min. Provide a low-stimulus environment. Monitor for shock and treat if necessary . Anticipate seizures and treat if necessary . For eye contamination, flush eyes immediately with water. Irrigate each eye continuously with normal saline during transport . Do not use emetics. For ingestion, rinse mouth and administer 5 mL/kg up to 200 mL of water for dilution if the patient can swallow, has a strong gag reflex, and does not drool . Treat frostbite by rapid rewarming . Ethers and related compounds

## **SECTION 5: Firefighting measures**

### **Suitable extinguishing media**

Water, foam, mist, fog, spray, dry chemical.

### **Specific hazards arising from the chemical**

May form phosgene or hydrogen chloride in fires. There is danger of explosion when ethers are heated or exposed to flames or sparks. Ethers tend to form peroxides; when ethers containing peroxides are heated, they can detonate. May be ignited by heat, sparks, or flames. Container may explode in heat of fire. Vapor explosion and poison hazard indoors, outdoors or in sewers. Decomposes in the presence of moisture to form hydrochloric acid. Emits toxic fumes when heated to decomposition. Reacts vigorously with oleum and chlorosulfonic acid. Ethers tend to form peroxides upon standing. Heating peroxide-containing ethers can cause detonation. (EPA, 1998)

### **Special protective actions for fire-fighters**

Use water spray, foam, powder, carbon dioxide. In case of fire: keep cylinder cool by spraying with water. NO direct contact with water.

## SECTION 6: Accidental release measures

### Personal precautions, protective equipment and emergency procedures

Personal protection: chemical protection suit. Ventilation. Remove all ignition sources. 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

Personal protection: chemical protection suit. Ventilation. Remove all ignition sources. 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

1. remove all ignition sources. 2. ventilate area of spill or leak. 3. for small quantities, absorb on paper towels. evaporate in a safe place (such as a fume hood). allow sufficient time for evaporating vapors to completely clear the hood ductwork. burn the paper in a suitable location away from combustible materials. large quantities can be reclaimed.

## SECTION 7: Handling and storage

### Precautions for safe handling

NO open flames, NO sparks and NO smoking. Above 55°C use a closed system and ventilation. 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 food and feedstuffs. See Chemical Dangers. Keep in the dark. Well closed. Store in a cool, dry, well-ventilated location. Store away from heat, oxidizing materials, strong acids, & sunlight.

## SECTION 8: Exposure controls/personal protection

### Control parameters

### Occupational Exposure limit values

TLV: 5 ppm as TWA; 10 ppm as STEL; (skin); A4 (not classifiable as a human carcinogen).MAK: 59 mg/m<sup>3</sup>, 10 ppm; peak limitation category: I(1); skin absorption (H)

#### **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. Liquid.
Colour:	Colourless.
Odour:	PUNGENT
Melting point/freezing point:	-51.9 °C.

Boiling point or initial boiling point and boiling range:	> 172 - < 178 °C. Remarks:The atmospheric pressure at which the boiling point was measured is.
Flammability:	Class II Combustible Liquid: Fl.P. at or above 100°F and below 140°F.
Lower and upper explosion limit/flammability limit:	no data available
Flash point:	81 °C. Atm. press.:1 013.25 hPa.
Auto-ignition temperature:	369 °C. Remarks:No data on atmospheric pressure.
Decomposition temperature:	no data available
pH:	no data available
Kinematic viscosity:	dynamic viscosity (in mPa s) = 2.41. Temperature:20°C.;dynamic viscosity (in mPa s) = 2.14. Temperature:25°C.
Solubility:	Reaction (NTP, 1992)
Partition coefficient n-octanol/water:	log Pow = 1.12. Temperature:20 °C. Remarks:PH.
Vapour pressure:	1.867 hPa. Temperature:25 °C.;0.947 hPa. Temperature:20 °C.
Density and/or relative density:	1.219 dimensionless. Temperature:20 °C.;1.213 dimensionless. Temperature:25 °C.
Relative vapour density:	4.93 (EPA, 1998) (Relative to Air)
Particle characteristics:	no data available

## SECTION 10: Stability and reactivity

### Reactivity

NIOSH considers dichloroethyl ether to be a potential occupational carcinogen.

The substance can form explosive peroxides on exposure to air and light. Decomposes on burning. Decomposes on contact with water. This produces toxic fumes including hydrogen chloride. Reacts with strong oxidants. Reacts violently with chlorosulfonic acid and oleum.

#### **Chemical stability**

no data available

#### **Possibility of hazardous reactions**

FLAMMABLE LIQUID WHEN EXPOSED TO HEAT, FLAME, OR OXIDANTS. The vapour is heavier than air. 2,2'-DICHLORODIETHYL ETHER may form phosgene or hydrogen when heated to high temperature. Oxidizes readily in air to form unstable peroxides that may explode spontaneously [Bretherick, 1979 p.151-154]. Mixing in equal molar portions with the following substances in a closed container caused the temperature and pressure to increase: chlorosulfonic acid and oleum [NFPA 1991].

#### **Conditions to avoid**

no data available

#### **Incompatible materials**

It decomposes in presence of moisture to form hydrochloric acid.

#### **Hazardous decomposition products**

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

### **SECTION 11: Toxicological information**

#### **Acute toxicity**

Oral: LD50 - rat (male) - 75 mg/kg bw.

Inhalation: LC50 - rat - ca. 250 ppm.

Dermal: LD50 - rabbit - 90 mg/kg bw.

#### **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**

No information is available on the developmental or reproductive effects of dichloroethyl ether in humans. In one animal study, no effects were observed on the reproductive tissues of the animals, but no tests on reproductive function were performed.

**STOT-single exposure**

The substance is irritating to the eyes and respiratory tract. Inhalation of the vapour may cause lung oedema. See Notes. Exposure far above the OEL could cause death. The effects may be delayed. Medical observation is indicated.

**STOT-repeated exposure**

Repeated or prolonged contact with skin may cause dermatitis.

**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****Toxicity**

Toxicity to fish: LC50 - *Oryzias latipes* - > 100 mg/L - 96 h.

Toxicity to daphnia and other aquatic invertebrates: LC50 - Daphnia magna - 340 mg/L - 24 h.

Toxicity to algae: EC50 - Pseudokirchneriella subcapitata (previous names: Raphidocelis subcapitata, Selenastrum capricornutum) - > 79.44 mg/L - 72 h.

Toxicity to microorganisms: IC50 - activated sludge, domestic - > 1 000 mg/L - 3 h.

### **Persistence and degradability**

Bis(2-chloroethyl) ether was added to Ohio River water at pH 7.2 and 22-25 deg C(1). Thirty-five days following the addition of bis(2-chloroethyl) ether to the water, 50% of the carbon dioxide theoretically derivable from bis(2-chloroethyl) ether was recovered. After a second addition of bis(2-chloroethyl) ether, only 9-10 days were required to observe 50% recovery of theoretical carbon dioxide, suggesting acclimation was necessary for optimal biodegradation rates(1). The absence of evidence of biodegradation in another study(2) may be attributed to an insufficiently long acclimation period (18 days)(SRC). Bis(2-chloroethyl) ether, present at 100 mg/l, reached 8.3% of its theoretical BOD in 3 weeks using an activated sludge inoculum(3).

### **Bioaccumulative potential**

A BCF of 0.4 to 1.3 in carp(1) and a BCF of 11 in bluegills exposed to bis(2-chloroethyl) ether for 14 days(2) was observed. According to a classification scheme(3), these BCF values suggest that the potential for bioconcentration in aquatic organisms is low.

### **Mobility in soil**

The Koc of bis(2-chloroethyl) ether is estimated as approximately 120(SRC), using a log Kow of 1.29(1) and a regression-derived equation(2,SRC). According to a classification scheme(3), this estimated Koc value suggests that bis(2-chloroethyl) ether is expected to have high mobility in soil(SRC). In a 140 cm long column containing Lincoln fine sand collected in Ada, OK, 86% of the applied bis(2-chloroethyl) ether reached 140 cm, indicating minimal adsorption to this soil(4).

### **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: UN2810 (For reference only, please check.)

IMDG: UN2810 (For reference only, please check.)

IATA: UN2810 (For reference only, please check.)

### **UN Proper Shipping Name**

ADR/RID: TOXIC LIQUID, ORGANIC, N.O.S. (For reference only, please check.)

IMDG: TOXIC LIQUID, ORGANIC, N.O.S. (For reference only, please check.)

IATA: TOXIC LIQUID, ORGANIC, N.O.S. (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: I (For reference only, please check.)

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

IATA: I (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](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

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. Immediate administration of an appropriate inhalation therapy by a doctor or a person authorized by him/her, should be considered. An added stabilizer or inhibitor can influence the toxicological properties of this substance, consult an expert. Check for peroxides prior to distillation; eliminate if found.

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