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SAFETY DATA SHEETS

According to the UN GHS revision 9

Version: 1.1
Creation Date: July 15, 2019
Revision Date: April 24, 2024

SECTION 1: Identification

1.1 GHS Product identifier

Product name Bis-(2-Chloroethyl)Ether

1.2 Other means of identification

Product number CCEM500459
Other names 2,2'-Dichlorodiethyl Ether; Bis(2-Chloroethyl)ether; 1-chloro-2-(2-chloroethoxy)ethane

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

Acute toxicity - Category 2, Oral
Acute toxicity - Category 1, Dermal
Acute toxicity - Category 2, Inhalation
Carcinogenicity, Category 2

2.2 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.

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
Bis-(2-Chloroethyl)Ether	Bis(2-chloroethyl) ether	111-44-4	203-870-1	100%

SECTION 4: First-aid measures

4.1 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 .

4.2 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)

4.3 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: Fire-fighting measures

5.1 Suitable extinguishing media

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

5.2 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)

5.3 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

6.1 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.

6.2 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.

6.3 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

7.1 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.

7.2 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 form heat, oxidizing materials, strong acids, & sunlight.

SECTION 8: Exposure controls/personal protection

8.1 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/m3, 10 ppm; peak limitation category: I(1); skin absorption (H)

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	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

10.1 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.

10.2 Chemical stability

no data available

10.3 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].

10.4 Conditions to avoid

no data available

10.5 Incompatible materials

It decomposes in presence of moisture to form hydrochloric acid.

10.6 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

12.1 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.

12.2 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).

12.3 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.

12.4 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).

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

14.2 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.)

14.3 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.)

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

Bis(2-chloroethyl) ether	Bis(2-chloroethyl) ether	111-44-4	203-870-1
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, 2019
Revision Date	April 24, 2024

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

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.

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

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