# SAFETY DATA SHEET

Updated on 26/09/2024

## 1. Material Identification

**Product Name** : Methane, oxybis[chloro-
**Catalog Number** : io-2625
**CAS Number** : 542-88-1
**Identified uses** : Laboratory chemicals, manufacture of chemical compounds
**Company** : Ionz

**>> R&D Use only**

## 2. Hazards Identification

### GHS Classification:

Flammable liquid ( category 2 )
Acute toxicity, oral (Category 3)
Acute toxicity, dermal (Category 3)
Acute toxicity, inhalation (Category 3)
Specific target organ toxicity, single exposure (Category 1)

**Pictogram(s)**

**GHS Hazard Statements**

>> H225 (100%): Highly Flammable liquid and vapor [Danger Flammable liquids]

>> H302 (100%): Harmful if swallowed [Warning Acute toxicity, oral]

>> H311 (100%): Toxic in contact with skin [Danger Acute toxicity, dermal]

>> H330 (100%): Fatal if inhaled [Danger Acute toxicity, inhalation]

>> H350 (100%): May cause cancer [Danger Carcinogenicity]

**Precautionary Statement Codes**

>> P203, P210, P233, P240, P241, P242, P243, P260, P262, P264, P270, P271, P280, P284, P301+P317, P302+P352, P303+P361+P353, P304+P340, P316, P318, P320, P321, P330, P361+P364, P370+P378, P403+P233, P403+P235, P405, and P501

**NFPA 704 Diamond**


**NFPA Health Rating**

>> 4 - Materials that, under emergency conditions, can be lethal.

**NFPA Fire Rating**

>> 3 - Liquids and solids that can be ignited under almost all ambient temperature conditions. Materials produce hazardous atmospheres with air under almost all ambient temperatures or, though unaffected by ambient temperatures, are readily ignited under almost all conditions.

**NFPA Instability Rating**

>> 1 - Materials that in themselves are normally stable but that can become unstable at elevated temperatures and pressures.

## Highly Hazardous Substance:

This section provides information on this chemical as a highly hazardous substance (due to potential safety and hazards issues from its high toxicity and/or reactivity). The information in this section is from two sources: (1) Annex XVII to REACH (Registration, Evaluation, Authorisation and Restriction of Chemicals) from the European Chemicals Agency (ECHA), (2) ECHA's Candidate List of Substances of Very High Concern (SVHC) for Authorisation and (3) the List of Highly Hazardous Chemicals, Toxics and Reactives (29 CFR 1910.119 Appendix A).

**OSHA Highly Hazardous Chemicals, Toxics and Reactives**

>> Chemical: Bis(Chloromethyl) Ether

>> Threshold: 100 [lb]

>> Note: Bis(Chloromethyl) Ether in quantities at or above above 100lb presents a potential for a catastrophic event as a toxic or reactive highly hazardous chemical.

## Health Hazards:

>> Acute toxicity is high by ingestion, inhalation, and skin irritation. Small quantities may cause death or permanent injury after very short exposure. Chloromethyl ether is an alkylating agent which is a recognized human carcinogen. There is a strong association between industrial exposure and excess lung cancer. (EPA, 1998)

**ERG 2024, Guide 131 (Dichlorodimethyl ether, symmetrical)**

>> TOXIC; may be fatal if inhaled, ingested or absorbed through skin.

>> Inhalation or contact with some of these materials will irritate or burn skin and eyes.

>> Methyl chloroacetate (UN2295) is an eye irritant/lachrymator (causes flow of tears).

>> Fire will produce irritating, corrosive and/or toxic gases.

>> Vapors may cause dizziness or asphyxiation, especially when in closed or confined areas.

>> Runoff from fire control or dilution water may cause environmental contamination.

>> Container may explode in heat of fire. When heated to decomposition, it emits very toxic fumes of chlorides. Decomposed by water to hydrochloric acid and formaldehyde. Avoid water: hydrolyzes very rapidly (half life 10-40 seconds) on contact with water. Avoid decomposing heat, powerful oxidizers, areas of high fire hazard and moist air. (EPA, 1998)

**ERG 2024, Guide 131 (Dichlorodimethyl ether, symmetrical)**

>> HIGHLY FLAMMABLE: Will be easily ignited by heat, sparks or flames.

>> CAUTION: Methanol (UN1230) will burn with an invisible flame. Use an alternate method of detection (thermal camera, broom handle, etc.)

>> Vapors may form explosive mixtures with air.

>> Vapors may travel to source of ignition and flash back.

>> Most vapors are heavier than air. They will spread along the ground and collect in low or confined areas (sewers, basements, tanks, etc.).

>> Vapor explosion and poison hazard indoors, outdoors or in sewers.

>> Those substances designated with a (P) may polymerize explosively when heated or involved in a fire.

>> Runoff to sewer may create fire or explosion hazard.

>> Containers may explode when heated.

>> Many liquids will float on water.

>> Highly flammable. Vapour/air mixtures are explosive.

## 3. Composition/Information On Ingredients

**Chemical name** : Methane, oxybis[chloro-
**CAS Number** : 542-88-1
**Molecular Formula** : C2H4Cl2O
**Molecular Weight** : 114.9600 g/mol

## 4. First Aid Measures

### First Aid:

>> Note: Chloromethyl ether is a recognized human carcinogen.

>> Signs and Symptoms of Chloromethyl Ether Exposure: Acute exposure to chloromethyl ether may produce the following signs and symptoms: severe irritation and burning of the skin, eyes, and mucous membranes. Sore throat, fever, chills, dypsnea (difficulty breathing), chronic bronchitis, and pulmonary edema with productive cough may be noted.

>> Emergency Life-Support Procedures: Acute exposure to chloromethyl ether may require decontamination and life support for the victims. Emergency personnel should wear protective clothing appropriate to the type and degree of contamination. Air-purifying or supplied-air respiratory equipment should also be worn, as necessary. Rescue vehicles should carry supplies such as plastic sheeting and disposable plastic bags to assist in preventing spread of contamination.

>> Inhalation Exposure:

>> 1. Move victims to fresh air. Emergency personnel should avoid self-exposure to chloromethyl ether.

>> 2. Evaluate vital signs including pulse and respiratory rate, and note any trauma. If no pulse is detected, provide CPR. If not breathing, provide artificial respiration. If breathing is labored, administer 100% humidified oxygen or other respiratory support.

>> 3. Obtain authorization and/or further instructions from the local hospital for administration of an antidote or performance of other invasive procedures.

>> 4. Transport to a health care facility.

>> Dermal/Eye Exposure:

>> 1. Remove victims from exposure. Emergency personnel should avoid self-exposure to chloromethyl ether.

>> 3. Remove and isolate contaminated clothing as soon as possible.

>> 4. If eye exposure has occurred, eyes must be flushed with lukewarm water for at least 15 minutes.

>> 5. Wash exposed skin areas thoroughly with soap and water.

>> 6. Obtain authorization and/or further instructions from the local hospital for administration of an antidote or performance of other invasive procedures.

>> 7. Transport to a health care facility.

>> Ingestion Exposure:

>> 1. Evaluate vital signs including pulse and respiratory rate, and note any trauma. If no pulse is detected, provide CPR. If not breathing, provide artificial respiration. If breathing is labored, administer 100% humidified oxygen or other respiratory support.

>> 2. DO NOT induce vomiting or attempt to neutralize!

>> 4. Activated charcoal may be administered if victims are conscious and alert. Use 15 to 30 g (1/2 to 1 oz) for children, 50 to 100 g (1-3/4 to 3-1/2 oz) for adults, with 125 to 250 mL (1/2 to 1 cup) of water.

>> 5. Promote excretion by administering a saline cathartic or sorbitol to conscious and alert victims. Children require 15 to 30 g (1/2 to 1 oz) of cathartic; 50 to 100 g (1-3/4 to 3-1/2 oz) is recommended for adults.

>> 6. Transport to a health care facility. (EPA, 1998)

**ERG 2024, Guide 131 (Dichlorodimethyl ether, symmetrical)**

>> General First Aid:

>> Call 911 or emergency medical service.

>> Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves and avoid contamination.

>> Move victim to fresh air if it can be done safely.

>> Administer oxygen if breathing is difficult.

>> If victim is not breathing:

>> DO NOT perform mouth-to-mouth resuscitation; the victim may have ingestedor inhaled the substance.

>> If equipped and pulse detected, wash face and mouth, then give artificial respiration using a proper respiratory medical device (bag-valve mask, pocket mask equipped with a one-way valve or other device).

>> If no pulse detected or no respiratory medical device available, provide continuouscompressions. Conduct a pulse check every two minutes or monitor for any signs of spontaneous respirations.

>> Remove and isolate contaminated clothing and shoes.

>> For minor skin contact, avoid spreading material on unaffected skin.

>> In case of contact with substance, remove immediately by flushing skin or eyes with running water for at least 20 minutes.

>> For severe burns, immediate medical attention is required.

>> Effects of exposure (inhalation, ingestion, or skin contact) to substance may be delayed.

>> Keep victim calm and warm.

>> Keep victim under observation.

>> For further assistance, contact your local Poison Control Center.

>> Note: Basic Life Support (BLS) and Advanced Life Support (ALS) should be done by trained professionals.

>> Specific First Aid:

>> Wash skin with soap and water.

>> In case of burns, immediately cool affected skin for as long as possible with cold water. Do not remove clothing if adhering to skin.

>> In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping paper and/or the "ERAP" section.

**First Aid Measures**

**Inhalation First Aid**

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

**Skin First Aid**

>> 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. Refer immediately for medical attention .

**Eye First Aid**

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

**Ingestion First Aid**

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

## 5. Fire Fighting Measures

>> Vapors are heavier than air and will collect in low areas. Vapors may travel long distances to ignition sources and flashback. Vapors in confined areas may explode when exposed to fire. Storage containers and parts of containers may rocket great distances, in many directions.

>> Move container from fire area if you can do so without risk. Fight fire from maximum distance. Dike fire control water for later disposal; do not scatter the material.

>> Small fires: dry chemical, carbon dioxide, water spray, or foam. Large fires: water spray, fog, or foam. (EPA, 1998)

>> Use water spray, powder, alcohol-resistant foam, carbon dioxide. In case of fire: keep drums, etc., cool by spraying with water. NO direct contact with water.

## 6. Accidental Release Measures

### Isolation and Evacuation:

Isolation and evacuation measures to take when a large amount of this chemical is accidentally released in an emergency.

>> Excerpt from ERG Guide 131 [Flammable Liquids - Toxic]:

>> IMMEDIATE PRECAUTIONARY MEASURE: Isolate spill or leak area for at least 50 meters (150 feet) in all directions.

>> SPILL: Increase the immediate precautionary measure distance, in the downwind direction, as necessary.

>> FIRE: If tank, rail tank car or highway tank is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions. (ERG, 2024)

**Evacuation: ERG 2024, Guide 131 (Dichlorodimethyl ether, symmetrical)**

>> Immediate precautionary measure

>> Isolate spill or leak area for at least 50 meters (150 feet) in all directions.

>> Spill

>> For non-highlighted materials: increase the immediate precautionary measure distance, in the downwind direction, as necessary.

>> Fire

>> If tank, rail tank car or highway tank is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.

### Spillage Disposal:

Methods for containment and safety measures to protect workers dealing with a spillage of this chemical.

>> Evacuate danger area! Consult an expert! Personal protection: complete protective clothing including self-contained breathing apparatus. 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.

**Accidental Release Measures**

**Public Safety: ERG 2024, Guide 131 (Dichlorodimethyl ether, symmetrical)**

>> CALL 911. Then call emergency response telephone number on shipping paper. If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.

>> Keep unauthorized personnel away.

>> Stay upwind, uphill and/or upstream.

>> Ventilate closed spaces before entering, but only if properly trained and equipped.

**Spill or Leak: ERG 2024, Guide 131 (Dichlorodimethyl ether, symmetrical)**

>> ELIMINATE all ignition sources (no smoking, flares, sparks or flames) from immediate area.

>> All equipment used when handling the product must be grounded.

>> Do not touch or walk through spilled material.

>> Stop leak if you can do it without risk.

>> Prevent entry into waterways, sewers, basements or confined areas.

>> A vapor-suppressing foam may be used to reduce vapors.

>> Small Spill

>> Absorb with earth, sand or other non-combustible material and transfer to containers for later disposal.

>> Use clean, non-sparking tools to collect absorbed material.

>> Large Spill

>> Dike far ahead of liquid spill for later disposal.

>> Water spray may reduce vapor, but may not prevent ignition in closed spaces.

## 7. Handling And Storage

### Safe Storage:

>> Fireproof. Dry. Cool. Separated from food and feedstuffs. Store only in original packaging.

### Storage Conditions:

>> Store in a flammable liquid storage area or approved cabinet away from ignition sources and corrosive and reactive materials. ... Store in a secure poison location. ... Store separately in a corrosive-resistant location. ... . Prior to working with this chemical you should be trained on its proper handling and storage. Before entering confined space where this chemical may be present, check to make sure that an explosive concentration does not exist. Store in airtight containers in a cool, dry, well-ventilated area. Metal containers involving the transfer of this chemical should be grounded and bonded. Where possible, automatically pump liquid from drums or other storage containers to process containers. Drums must be equipped with self-closing valves, pressure vacuum bungs, and flame arresters. Use only nonsparking tools and equipment, especially when opening and closing containers of this chemical. Sources of ignition, such as smoking and open flames, are prohibited where this chemical is used, handled, or stored in a manner that could create a potential fire or explosion hazard. A regulated, marked area should be established where this chemical is handled, used, or stored in compliance with OSHA Standard 1910.1045.

## 8. Exposure Control/ Personal Protection

**PEL-TWA (8-Hour Time Weighted Average)**

>> Ca

>> 0.001 [ppm]

>> 0.001 ppm as TWA; A1 (confirmed human carcinogen).

**TLV-TWA (Time Weighted Average)**

>> 0.001 ppm [1979]

**MAK (Maximale Arbeitsplatz Konzentration)**

>> carcinogen category: 1

**Emergency Response: ERG 2024, Guide 131 (Dichlorodimethyl ether, symmetrical)**

>> CAUTION: The majority of these products have a very low flash point. Use of water spray when fighting fire may be inefficient.

>> CAUTION: Methanol (UN1230) will burn with an invisible flame. Use an alternate method of detection (thermal camera, broom handle, etc.)

>> Small Fire

>> Dry chemical, CO2, water spray or alcohol-resistant foam.

>> Large Fire

>> Water spray, fog or alcohol-resistant foam.

>> If it can be done safely, move undamaged containers away from the area around the fire.

>> Dike runoff from fire control for later disposal.

>> Avoid aiming straight or solid streams directly onto the product.

>> Fire Involving Tanks, Rail Tank Cars or Highway Tanks

>> Fight fire from maximum distance or use unmanned master stream devices or monitor nozzles.

>> Cool containers with flooding quantities of water until well after fire is out.

>> Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.

>> ALWAYS stay away from tanks in direct contact with flames.

>> For massive fire, use unmanned master stream devices or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

>> ERPG-1: Insufficient data - one hour exposure limit: 1 = mild transient health effects or objectionable odor [AIHA]

>> ERPG-2: 0.1 ppm - one hour exposure limit: 2 = impaired ability to take protective action [AIHA]

>> ERPG-3: 0.5 ppm - one hour exposure limit: 3 = life threatening health effects [AIHA]

### Inhalation Risk:

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

### Effects of Short Term Exposure:

>> The substance is corrosive to the eyes, skin and respiratory tract. Corrosive on ingestion. Inhalation may cause lung oedema. The effects may be delayed. Exposure at high concentrations could cause death.

### Effects of Long Term Exposure:

>> This substance is carcinogenic to humans.

**Fire Prevention**

>> NO open flames, NO sparks and NO smoking. Closed system, ventilation, explosion-proof electrical equipment and lighting.

**Exposure Prevention**

>> AVOID ALL CONTACT! IN ALL CASES CONSULT A DOCTOR!

**Inhalation Prevention**

>> Use closed system or ventilation.

**Skin Prevention**

>> Protective clothing. Protective gloves.

**Eye Prevention**

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

**Ingestion Prevention**

>> Do not eat, drink, or smoke during work. Wash hands before eating.

**Exposure Control and Personal Protection**

**Protective Clothing: ERG 2024, Guide 131 (Dichlorodimethyl ether, symmetrical)**

>> Wear positive pressure self-contained breathing apparatus (SCBA).

>> Wear chemical protective clothing that is specifically recommended by the manufacturer when there is NO RISK OF FIRE.

>> Structural firefighters' protective clothing provides thermal protection but only limited chemical protection.

## 9. Physical And Chemical Properties

**Molecular Weight:**

>> 114.96

**Exact Mass:**

>> 113.9639201

**Physical Description:**

>> Dichlorodimethyl ether, symmetrical appears as a colorless volatile liquid with a chloroform-like odor. Toxic by inhalation, skin absorption and ingestion. Dangerous fire risk - flash point below 0 °F. Vapors much denser than air. Insoluble in water and denser than water. Used to make paints and varnish, and as a solvent.

>> COLOURLESS LIQUID WITH PUNGENT ODOUR.

**Color/Form:**

>> Colorless liquid

**Odor:**

>> Suffocating odor

**Boiling Point:**

>> 223 °F at 760 mmHg (EPA, 1998)

>> 104-106 °C

**Melting Point:**

>> -42.7 °F (EPA, 1998)

>> -42 °C

**Flash Point:**

>> Less than 66.2F (EPA, 1998)

**Solubility:**

>> Reacts with water (NIOSH, 2024)

>> Solubility in water: reaction

**Density:**

>> 1.315 at 68 °F (EPA, 1998) - Denser than water; will sink

>> Relative density (water = 1): 1.3

**Vapor Density:**

>> 4 (EPA, 1998) - Heavier than air; will sink (Relative to Air)

>> Relative vapor density (air = 1): 4.0

**Vapor Pressure:**

>> 30 mmHg at 71.6 °F (EPA, 1998)

>> Vapor pressure, kPa at 25 °C: 3.9

**LogP:**

>> log Kow = 1.04

>> 1.05

**Stability/Shelf Life:**

>> Unstable in moist air.

**Decomposition:**

>> Decomposed by water to /hydrochloric acid/ and formaldehyde.

**Refractive Index:**

>> Index of refraction: 1.435 at 21 °C/D

## 10. Stability And Reactivity

>> Highly flammable. Insoluble in water. Reacts with water to form hydrochloric acid & formaldehyde.

>> Highly Flammable

>> Water-Reactive

### Peroxide Forming Chemical:

Peroxide-forming chemicals (PFCs) are chemicals that can "auto-oxidize" with atmospheric oxygen under ambient conditions to form organic peroxides (contains an -O-O- bond). Peroxide formation can be initiated by exposure to air, self-polymerization, or solvent impurities. Once formed, organic peroxides are sensitive to thermal or mechanical shock and can be violently explosive in concentrated solutions or as solids.

**Chemical**

>> Bis(chloromethyl) ether

**Class (* = UMN Designation)**

>> D: Other compounds that may form peroxides

**Reference(s)**

>> Kelly

## 11. Toxicological Information

**Toxicity Summary:**

>> IDENTIFICATION AND USE: Bis(chloromethyl) ether (BCME) is a colorless liquid. Historical uses of BCME include crosslinking of cellulose, preparation of styrene and other polymers, surface treatment of vulcanized rubber to increase adhesion, and manufacture of flame-retardant fabrics. It is used in the manufacture of plastics and ion exchange resins, and as a laboratory reagent. HUMAN STUDIES: Potential symptoms of overexposure include irritation of the eyes, skin, mucous membranes and respiratory system, as well as pulmonary congestion, edema, corneal damage, necrosis, decreased pulmonary function, coughing, dyspnea and wheezing, blood stained sputum, and bronchial secretions. A retrospective investigation of a small group of workers exposed to the compound between 1956 and 1962 revealed 6 cases of lung cancer among 18 men employed in a testing laboratory. Five of the 6 men were moderate smokers and 1 was a non-smoker. Two further cases were found among a group of 50 production workers. Five of the total 8 reported cases are stated to have been oat cell carcinomas. The exposure period ranged from 6-9 years and the latent period from first exposure to diagnosis was from 8-16 years. BCME induced unscheduled DNA synthesis and cell transformation in cultured human fibroblasts. A slight increase in the incidence of chromosomal aberrations was observed in blood lymphocytes of workers exposed to BCME during the preparation of ion-exchange resins. ANIMAL STUDIES: Exposure of rabbits for 3 min to atmosphere saturated with BCME caused milky corneal opacity and CNS depression. During inhalation of BCME in laboratory animal studies, irritation of the eyes and respiratory tract were noted as well as necrotizing bronchitis. Skin application resulted in erythema and necrosis. Increased mortality and tracheal hyperplasia were observed in rats and hamsters following multiple inhalation exposure. Carcinogenicity studies in experimental animals (mice and rats) exposed to BCME showed significantly elevated incidence of pulmonary adenomas and respiratory tumors. In mice, inhalation exposure also showed evidence of an elevated incidence of lung tumors. Incidence of pulmonary squamous cell carcinomas and esthesioneuroepitheliomas of the nose was described in a small series of rats exposed to inhalation of BCME in a concentration of 0.1 ppm. BCME was mutagenic in bacteria, but it did not cause chromosomal aberrations in bone-marrow cells of rats exposed to vapors for six months. BCME is among the most potent animal and human carcinogens known. Sufficient information is available to support a genotoxic mode of action.

**Evidence for Carcinogenicity:**

Evidence that this chemical does or may cause cancer. The information here is collected from various sources by the Hazardous Substances Data Bank (HSDB).

>> CLASSIFICATION: A; human carcinogen. BASIS FOR CLASSIFICATION: Statistically significant increases in lung tumors (oat cell carcinomas) observed in six studies of exposed workers and bioassay data from rats and mice. HUMAN CARCINOGENICITY DATA: Sufficient. ANIMAL CARCINOGENICITY DATA: Sufficient.

**Exposure Routes:**

>> The substance can be absorbed into the body by inhalation of its vapour, through the skin and by ingestion.

**Inhalation Exposure**

>> Cough. Burning sensation. Wheezing. Shortness of breath. Headache. Vomiting. Laboured breathing.

**Skin Exposure**

>> MAY BE ABSORBED! Redness. Burning sensation. Skin burns.

**Eye Exposure**

>> Redness. Pain. Blurred vision. Severe deep burns.

**Ingestion Exposure**

>> Burns in mouth and throat. Burning sensation behind the breastbone. Abdominal pain. Shock or collapse.

**Target Organs:**

Organs that are affected by exposure to this chemical. Information in this section reflects human data unless otherwise noted.

>> Cancer, Respiratory (From the Nose to the Lungs)

**Cancer Sites:**

The site in which cancer develops due to exposure to this compound. Cancers are casually referred to based on their primary sites (e.g., skin, lung, breasts, prostate, colon and rectum).

>> Respiratory

**Adverse Effects:**

An adverse effect is an undesired harmful effect resulting from a medical treatment or other intervention.

>> Dermatotoxin - Skin burns.

>> Toxic Pneumonitis - Inflammation of the lungs induced by inhalation of metal fumes or toxic gases and vapors.

>> IARC Carcinogen - Class 1: International Agency for Research on Cancer classifies chemicals as established human carcinogens.

>> NTP Carcinogen - Known to be a human carcinogen.

>> ACGIH Carcinogen - Confirmed Human.

**Toxicity Data:**

>> LC50 (rat) = 7 ppm/7h

**Interactions:**

>> ... /Administration/ to skin of single dose of 1 mg ... dissolved in 0.1 mL benzene, followed by thrice weekly applications of acetone solution of 0.025 mg in 0.1 mL mixed phorbol esters from croton oil 14 days after initiation treatment ... 2 mice had squamous cell carcinomas, 1 with metastases to lung. Median survival time ... 474 days. /Controls for this experiment not discussed in this review./

**Antidote and Emergency Treatment:**

>> Immediate first aid: Ensure that adequate decontamination has been carried out. If patient is not breathing, start artificial respiration, preferably with a demand-valve resuscitator, bag-valve-mask device, or pocket mask, as trained. Perform CPR if necessary. Immediately flush contaminated eyes with gently flowing water. Do not induce vomiting. If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain an open airway and prevent aspiration. Keep patient quiet and maintain normal body temperature. Obtain medical attention. /Ethers and related compounds/

**Human Toxicity Excerpts:**

>> /SIGNS AND SYMPTOMS/ Potential symptoms of overexposure are irritation of eyes, skin, mucous membranes and respiratory system; pulmonary congestion, edema; corneal damage, necrosis; decreased pulmonary function, coughing, dyspnea and wheezing; blood stained sputum, bronchial secretions.

**Non-Human Toxicity Excerpts:**

>> /LABORATORY ANIMALS: Acute Exposure/ Exposure of rabbits for 3 min to atmosphere saturated with /bis(chloromethyl) ether vapor/ caused milky corneal opacity and CNS depression.

**Non-Human Toxicity Values:**

>> LC50 Hamster inhalation 7 ppm/7 hr

## 12. Ecological Information

**Resident Soil (mg/kg)**

>> 8.3e-05

**Industrial Soil (mg/kg)**

>> 3.60e-04

**Resident Air (ug/m3)**

>> 4.5e-05

**Industrial Air (ug/m3)**

>> 2.00e-04

**Tapwater (ug/L)**

>> 7.2e-05

**MCL (ug/L)**

>> 4.00e+00

**Risk-based SSL (mg/kg)**

>> 1.7e-08

**Oral Slope Factor (mg/kg-day)-1**

>> 2.20e+02

**Inhalation Unit Risk (ug/m3)-1**

>> 6.20e-02

**Volatile**

>> Volatile

**Mutagen**

>> Mutagen

**Fraction of Contaminant Absorbed in Gastrointestinal Tract**

>> 1

**Soil Saturation Concentration (mg/kg)**

>> 4.22e+03

### Sediment/Soil Concentrations:

Concentrations of this compound in sediment/soil.

>> SEDIMENT: USEPA STORET DATABASE, 213 sediment data points, 0% pos for bis(chloromethyl) ether(1).

## 13. Disposal Considerations

**Spillage Disposal**

>> Evacuate danger area! Consult an expert! Personal protection: complete protective clothing including self-contained breathing apparatus. 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.

**Disposal Methods**

>> Generators of waste (equal to or greater than 100 kg/mo) containing this contaminant, EPA hazardous waste number P016, must conform with USEPA regulations in storage, transportation, treatment and disposal of waste.

>> SRP: Wastewater from contaminant suppression, cleaning of protective clothing/equipment, or contaminated sites should be contained and evaluated for subject chemical or decomposition product concentrations. Concentrations shall be lower than applicable environmental discharge or disposal criteria. Alternatively, pretreatment and/or discharge to a permitted wastewater treatment facility is acceptable only after review by the governing authority and assurance that "pass through" violations will not occur. Due consideration shall be given to remediation worker exposure (inhalation, dermal and ingestion) as well as fate during treatment, transfer and disposal. If it is not practicable to manage the chemical in this fashion, it must be evaluated in accordance with EPA 40 CFR Part 261, specifically Subpart B, in order to determine the appropriate local, state and federal requirements for disposal.

>> Incineration, preferably after mixing with another combustible fuel. Care must be exercised to assure complete combustion to prevent the formation of phosgene. An acid scrubber is necessary to remove the halo acids produced.

>> A potential candidate for liquid injection incineration at a temperature range of 650 to 1,600 °C and a residence time of 0.1 to 2 seconds. A potential candidate for rotary kiln incineration at a temperature range of 820 to 1,600 °C and residence times of seconds for liquids and gases, and hours for solids. A potential candidate for fluidized bed incineration at a temperature range of 450 to 980 °C and residence times of seconds for liquids and gases, and longer for solids.

>> For more Disposal Methods (Complete) data for Bis(chloromethyl) ether (11 total), please visit the HSDB record page.

## 14. Transport Information

**DOT**

Methane, oxybis[chloro-
6.1

Reportable Quantity of 10 lb or 4

**IATA**

Methane, oxybis[chloro-
6.1, 3

## 15. Regulatory Information

### DHS Chemicals of Interest (COI):

This section provides the Department of Homeland Security (DHS) Chemicals of Interest (COI) and related information (Ref: 6 eCFR part 27 - https://www.ecfr.gov/current/title-6/chapter-I/part-27).

**Chemicals of Interest(COI)**

>> Chloromethyl ether

**Release: Minimum Concentration (%)**

>> 1

**Release: Screening Threshold Quantities (in pounds)**

>> 1000

**Security Issue: Release - Toxic**

>> Toxic chemical that can be released at a facility.

### Clean Water Act Requirements:

The Clean Water Act (CWA) of 1972 establishes the basic structure for regulating discharges of pollutants into the waters of the United States and regulating quality standards for surface waters. Under CWA, the U.S. Environmental Protection Agency (EPA) developed the Toxic Pollutant List (40 CFR Part 401.15) and the Priority Pollutant List (40 CFR Part 423, Appendix A). These lists are to be used by EPA and States to develop the Effluent Guidelines regulations and ensure water quality criteria and standards.

>> For the maximum protection of human health from the potential carcinogenic effects of exposure to bis(chloromethyl) ether through ingestion of contaminated water and contaminated aquatic organisms, the ambient water concentrations should be zero, based on the nonthreshold assumption for this chemical. However, zero level may not be attainable at the present time. Therefore, the levels which may result in incremental increase of cancer risk over the lifetime are estimated at 10-5, 10-6, and 10-7. The corresponding recommended criteria are 37.6 x 10-6 ug/L, 3.76 x 10-6 ug/L, and 0.376 x 10-6 ug/L, respectively. If these estimates are made for consumption of aquatic organisms only, excluding consumption of water, the levels are 18.4 x 10-3 ug/L, 1.84 x 10-3 ug/L, and 0.184 x 10-3 ug/L, respectively.

**Regulatory Information**

**New Zealand EPA Inventory of Chemical Status**

>> Bis(chloromethyl) ether: Does not have an individual approval but may be used as a component in a product covered by a group standard. It is not approved for use as a chemical in its own right.

## 16. Other Information

### Toxic Combustion Products:

Toxic products (e.g., gases and vapors) produced from the combustion of this chemical.

>> Poisonous gases, including hydrogen chloride, are produced in fire.

"The information provided is believed to be accurate but is not comprehensive and should be used as a reference. It reflects our current knowledge and is intended for safety guidance related to the product. This document does not constitute a warranty of the product's properties. Ionz is not responsible for any damages resulting from handling or contact with the product incorrectly."