ionz

SAFETY DATA SHEET

Updated on 26/09/2024

1. Material Identification

Product Name : Dichloroethyl ether
Catalog Number : io-2160
CAS Number : 111-44-4
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

>> H226 (22.9%): Flammable liquid and vapor [Warning Flammable liquids]

>> H300+H310+H330 (27.5%): Fatal if swallowed, in contact with skin or if inhaled [Danger Acute toxicity, oral; acute toxicity, dermal; acute toxicity, inhalation]

>> H300 (100%): Fatal if swallowed [Danger Acute toxicity, oral]

>> H310 (100%): Fatal in contact with skin [Danger Acute toxicity, dermal]

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

>> H351 (100%): Suspected of causing cancer [Warning Carcinogenicity]

Precautionary Statement Codes

>> P203, P210, P233, P240, P241, P242, P243, P260, P262, P264, P270, P271, P280, P284, P301+P316, 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

>> 2 - Materials that, under emergency conditions, can cause temporary incapacitation or residual injury.

NFPA Fire Rating

>> 2 - Materials that must be moderately heated or exposed to relatively high ambient temperatures before ignition can occur. Materials would not under normal conditions form hazardous atmospheres with air, but under high ambient

temperatures or under moderate heating could release vapor in sufficient quantities to produce hazardous atmospheres with air.

NFPA Instability Rating

>> 0 - Materials that in themselves are normally stable, even under fire conditions.

Health Hazards:

>> 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)

ERG 2024, Guide 152 (Dichloroethyl ether)

>> Highly toxic, may be fatal if inhaled, ingested or absorbed through skin.

>> Contact with molten substance may cause severe burns to skin and eyes.

>> Avoid any skin contact.

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

>> Runoff from fire control or dilution water may be corrosive and/or toxic and cause environmental contamination.

ERG 2024, Guide 152 (2,2'-Dichlorodiethyl ether)

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>> Avoid any skin contact.

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

>> Runoff from fire control or dilution water may be corrosive and/or toxic and cause environmental contamination.

>> 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)

ERG 2024, Guide 152 (Dichloroethyl ether)

>> Combustible material: may burn but does not ignite readily.

>> Containers may explode when heated.

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

>> Runoff may pollute waterways.

>> Substance may be transported in a molten form.

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

>> Runoff may pollute waterways.

>> Substance may be transported in a molten form.

>> Flammable. Gives off irritating or toxic fumes (or gases) in a fire. Above 55 °C explosive vapour/air mixtures may be formed.

3. Composition/Information On Ingredients

Chemical name : Dichloroethyl ether
CAS Number : 111-44-4
Molecular Formula : C4H8Cl2O
Molecular Weight : 143.0100 g/mol

4. First Aid Measures

First Aid:

>> Signs and Symptoms of Dichloroethyl Ether Exposure: Acute exposure to dichloroethyl ether may produce the following signs and symptoms: irritation of the eyes, skin, and mucous membranes, profuse tearing, coughing, retching, and vomiting. Contact with skin and eyes may cause burns. Respiratory signs may include irritation of the respiratory tract, which may progress to pulmonary edema.

>> Emergency Life-Support Procedures: Acute exposure to dichloroethyl 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 dichloroethyl 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 dichloroethyl 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. Obtain authorization and/or further instructions from the local hospital for administration of an antidote or performance of other invasive procedures.

>> 3. Vomiting may be induced with syrup of Ipecac. If elapsed time since ingestion of dichloroethyl ether is unknown or suspected to be greater than 30 minutes, do not induce vomiting and proceed to Step

>> 4. Ipecac should not be administered to children under 6 months of age.Warning: Syrup of Ipecac should be administered only if victims are alert, have an active gag-reflex, and show no signs of impending seizure or coma. If ANY uncertainty exists, proceed to Step

>> 4.The following dosages of Ipecac are recommended: children up to 1 year old, 10 mL (1/3 oz); children 1 to 12 years old, 15 mL (1/2 oz); adults, 30 mL (1 oz). Ambulate (walk) the victims and give large quantities of water. If vomiting has not occurred after 15 minutes, Ipecac may be readministered. Continue to ambulate and give water to the victims. If vomiting has not occurred within 15 minutes after second administration of Ipecac, administer activated charcoal.

>> 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 152 (Dichloroethyl ether)

>> 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:

>> Removal of solidified molten material from skin requires medical assistance.

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

ERG 2024, Guide 152 (2,2'-Dichlorodiethyl ether)

>> 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.

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>> If victim is not breathing:

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

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First Aid Measures

Inhalation First Aid

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

Skin First Aid

>> Remove contaminated clothes. Rinse and then wash skin with water and soap. Refer for medical attention .

Eye First Aid

>> First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then refer for medical attention.

Ingestion First Aid

>> Rinse mouth. Induce vomiting (ONLY IN CONSCIOUS PERSONS!). Rest. Refer for medical attention .

5. Fire Fighting Measures

>> Wear full protective clothing. Do not extinguish fire unless flow can be stopped. Cool all affected containers with flooding quantities of water. Apply water from as far a distance as possible.

>> Use water, foam, mist, fog, spray, or dry chemical. Use water in flooding quantities as fog. Small fires: dry chemical, carbon dioxide, water spray, or foam. Large fires: water spray, fog, or foam. Move container from fire area if you can do so without risk. Spray cooling water on containers that are exposed to flames until well after fire is out. Fight fire from maximum distance. Dike fire control water for later disposal; do not scatter the material. (EPA, 1998)

>> Use water spray, foam, powder, carbon dioxide. In case of fire: keep cylinder 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 152 [Substances - Toxic (Combustible)]:

>> IMMEDIATE PRECAUTIONARY MEASURE: Isolate spill or leak area in all directions for at least 50 meters (150 feet) for liquids and at least 25 meters (75 feet) for solids.

>> 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 152 (Dichloroethyl ether)

>> Immediate precautionary measure

>> Isolate spill or leak area in all directions for at least 50 meters (150 feet) for liquids and at least 25 meters (75 feet) for solids.

>> 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.

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>> Fire

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Spillage Disposal:

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

>> 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.

Accidental Release Measures

Public Safety: ERG 2024, Guide 152 (Dichloroethyl ether)

>> 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.

Spill or Leak: ERG 2024, Guide 152 (Dichloroethyl ether)

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

>> Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.

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

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

>> Cover with plastic sheet to prevent spreading.

>> Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers.

>> DO NOT GET WATER INSIDE CONTAINERS.

Public Safety: ERG 2024, Guide 152 (2,2'-Dichlorodiethyl ether)

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>> DO NOT GET WATER INSIDE CONTAINERS.

7. Handling And Storage

Safe Storage:

>> Fireproof. Separated from food and feedstuffs. See Chemical Dangers. Keep in the dark. Well closed.

Storage Conditions:

>> Store in a cool, dry, well-ventilated location. Store away form heat, oxidizing materials, strong acids, & sunlight.

8. Exposure Control/ Personal Protection

REL-TWA (Time Weighted Average)

>> 5 ppm (30 mg/m³)

REL-STEL (Short Term Exposure Limit)

>> 10 ppm (60 mg/m³)

>> Ca TWA 5 ppm (30 mg/m3) ST 10 ppm (60 mg/m3) [skin] See Appendix A

PEL-C (Ceiling)

>> 15 ppm (90 mg/m³)

>> TWA 15 ppm (90 mg/m3) [skin] See Appendix G

>> 5.0 [ppm]

TLV-STEL

>> 10.0 [ppm]

>> 5 ppm as TWA; 10 ppm as STEL; (skin); A4 (not classifiable as a human carcinogen).

TLV-TWA (Time Weighted Average)

>> 5 ppm [1985]

TLV-STEL (Short Term Exposure Limit)

>> 10 ppm [1985]

MAK (Maximale Arbeitsplatz Konzentration)

>> 59 mg/m

Emergency Response: ERG 2024, Guide 152 (Dichloroethyl ether)

>> Small Fire

>> Dry chemical, CO2 or water spray.

>> Large Fire

>> Water spray, fog or regular 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.

>> Do not get water inside containers.

>> 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.

Emergency Response: ERG 2024, Guide 152 (2,2'-Dichlorodiethyl ether)

>> Small Fire

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>> Water spray, fog or regular foam.

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

Inhalation Risk:

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

Effects of Short Term Exposure:

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

Effects of Long Term Exposure:

>> Repeated or prolonged contact with skin may cause dermatitis.

Fire Prevention

>> NO open flames, NO sparks and NO smoking. Above 55 °C use a closed system and ventilation.

Exposure Prevention

>> PREVENT GENERATION OF MISTS!

Inhalation Prevention

>> Use ventilation, local exhaust or breathing protection.

Skin Prevention

>> Protective gloves. Protective clothing.

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 152 (Dichloroethyl ether)

>> 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.

Protective Clothing: ERG 2024, Guide 152 (2,2'-Dichlorodiethyl ether)

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>> 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.

Maximum Allowable Concentration (MAK)

>> 0.5 [ppm]

9. Physical And Chemical Properties

Molecular Weight:

>> 143.01

Exact Mass:

>> 141.9952203

Physical Description:

>> 2,2'-dichlorodiethyl ether appears as a clear colorless liquid with a sweet pleasant or nauseating odor. Flash point 131 °F. Denser than water and insoluble in water. Toxic by inhalation and skin absorption. Used in cleaning compounds, paints, textile finishing, and as a general solvent.

>> CLEAR COLOURLESS LIQUID WITH CHARACTERISTIC ODOUR.

Color/Form:

>> COLORLESS, CLEAR LIQ

Odor:

>> PUNGENT

Boiling Point:

>> 352 °F at 760 mmHg (EPA, 1998)

>> 178 °C

Melting Point:

>> -58 °F (EPA, 1998)

>> -50 °C

Flash Point:

>> 131 °F (EPA, 1998)

>> 55 °C c.c.

Solubility:

>> Reaction (NTP, 1992)

Density:

>> 1.22 at 68 °F (EPA, 1998) - Denser than water; will sink

>> Relative density (water = 1): 1.22

Vapor Density:

>> 4.93 (EPA, 1998) - Heavier than air; will sink (Relative to Air)

>> Relative vapor density (air = 1): 4.9

Vapor Pressure:

>> 0.7 mmHg at 68 °F (EPA, 1998)

>> Vapor pressure, kPa at 25 °C: 0.206

LogP:

>> log Kow= 1.29

>> 1.29

Autoignition Temperature:

>> 696 °F (USCG, 1999)

>> 369 °C

Decomposition:

>> WHEN HEATED TO DECOMP, EMITS HIGHLY TOXIC FUMES OF /HYDROGEN CHLORIDE/.

Viscosity:

>> 2.0653 cP @ 25 °C

Corrosivity:

The ability of a chemical to damage or destroy other substances when it comes into contact.

>> NOT VERY CORROSIVE TO IRON, MILD STEEL, OR ALUMINUM.

Heat of Vaporization:

>> 79.5 CAL/G

Surface Tension:

>> 37.9 DYNES/CM @ 19 °C

Odor Threshold:

>> Odor Threshold Low: 0.04 [mmHg]

>> Odor threshold from CHEMINFO

Refractive Index:

>> INDEX OF REFRACTION: 1.451 @ 20 °C/D

10. Stability And Reactivity

>> Flammable. Insoluble in water. Reacts slowly with water to form HCl. Oxidizes readily in air to form unstable peroxides that may explode spontaneously [Bretherick, 1979 p.151-154].

>> Peroxidizable Compound

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(2-chloroethyl) ether

Class (* = UMN Designation)

>> D: Other compounds that may form peroxides

Reference(s)

>> Kelly, Cameo

Additional Reference(s)

>> https://cameochemicals.noaa.gov/chemical/3150

11. Toxicological Information

Toxicity Summary:

>> Quantitative information on the kinetics and metabolism of BCEE /bis(2-chloroethyl) ether/... in humans is not available. ... Limited data show that radioactive BCEE administered to rats by inhalation or gavage is rapidly absorbed. ... BCEE is readily metabolized in rats. The principal metabolite is thiodiglycolic acid ... BCEE is eliminated quickly in both rats and rhesus monkeys. ... BCEE is acutely toxic by the oral, inhalation or dermal routes of exposure. ... Exposure of laboratory animals by inhalation to high single concentrations ... resulted in eye irritation as well as congestion, edema, and hemorrhage in the lungs. ... In general, positive results were obtained when ... tested for mutagenicity in vitro. ... /In one study/ there was a significant increase in the incidence of hepatomas (combined benign hepatomas and malignant tumors) compared to unexposed controls. ... Other limited studies in rats and mice using oral gavage, subcutaneous or intraperitoneal injection and skin painting failed to confirm these findings. ... BCEE was found to be irritating to the eyes and nasal passages of humans ... following short term exposure. No epidemiological studies on the effects of long term exposure to BCEE have been reported. ... None of the long term studies in laboratory animals is of sufficient quality to provide quantitative information on either the potential of BCEE to cause cancer or the toxicological effects produced by long term exposure to this substance.

USGS Health-Based Screening Levels for Evaluating Water-Quality:

This section provides the USGS Health-Based Screening Levels for Evaluating Water-Quality data.

Chemical

>> bis(2-Chloroethyl)ether

Cancer HBSL [µg/L]

>> 0.03-3

Benchmark Remarks

>> Listed as Bis(chloroethyl)ether (BCEE)

Reference

>> Smith, C.D. and Nowell, L.H., 2024. Health-Based Screening Levels for evaluating water-quality data (3rd ed.). DOI:10.5066/F71C1TWP

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).

>> Cancer Classification: Group B2 Probable Human Carcinogen

Carcinogen Classification:

This section provides the International Agency for Research on Cancer (IARC) Carcinogenic Classification and related monograph links. In the IARC Carcinogenic classification, chemicals are categorized into four groups: Group 1 (carcinogenic to humans), Group 2A (probably carcinogenic to humans), Group 2B (possibly carcinogenic to humans), and Group 3 (not classifiable as to its carcinogenicity to humans).

IARC Carcinogenic Agent

>> Bis(2-chloroethyl)ether

IARC Carcinogenic Classes

>> Group 3: Not classifiable as to its carcinogenicity to humans

IARC Monographs

>> Volume 9: (1975) Some Aziridines, N-, S- and O-Mustards and Selenium

>> Volume Sup 7: Overall Evaluations of Carcinogenicity: An Updating of IARC Monographs Volumes 1 to 42, 1987; 440 pages; ISBN 92-832-1411-0 (out of print)

>> Volume 71: (1999) Re-evaluation of Some Organic Chemicals, Hydrazine and Hydrogen Peroxide (Part 1, Part 2, Part 3)

>> 3, not classifiable as to its carcinogenicity to humans. (L135)

Health Effects:

>> The principal acute effect of inhalation exposure to BCEE vapor is irritation and injury to the cells of the respiratory epithelium. BCEE vapors can cause loss of weight, nose irritation, severe injury to the lungs, and may lead to death. It might also cause cancer. (L183)

Exposure Routes:

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

>> inhalation, skin absorption, ingestion, skin and/or eye contact

Inhalation Exposure

>> Cough. Sore throat. Nausea. Vomiting. Burning sensation. Laboured breathing. Symptoms may be delayed.

Skin Exposure

>> MAY BE ABSORBED!

Eye Exposure

>> Redness. Pain.

Ingestion Exposure

>> Abdominal pain. Nausea. Vomiting. Burning sensation.

>> irritation nose, throat, respiratory system; lacrimation (discharge of tears); cough; nausea, vomiting; In Animals: pulmonary edema; liver damage; [potential occupational carcinogen]

Target Organs:

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

>> Body Weight, Ocular (Eyes), 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).

>> Hepatic

>> [in animals: liver tumors]

Adverse Effects:

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

>> Neurotoxin - Acute solvent syndrome

>> Occupational hepatotoxin - Secondary hepatotoxins: the potential for toxic effect in the occupational setting is based on cases of poisoning by human ingestion or animal experimentation.

>> Lacrimator (Lachrymator) - A substance that irritates the eyes and induces the flow of tears.

>> ACGIH Carcinogen - Not Classifiable.

Toxicity Data:

>> LC50 (rat) = 330 mg/m3/4H

Minimum Risk Level:

The minimal risk level (MRL) is an estimate of the amount of a chemical a person can eat, drink, or breathe each day without a detectable risk to health

>> Intermediate Inhalation: 0.02 ppm (L134)

Antidote and Emergency Treatment:

>> 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/

Human Toxicity Excerpts:

>> IN HUMAN BEINGS THE VAPOR IS HIGHLY IRRITANT TO THE EYES, NOSE AND RESPIRATORY PASSAGES. ONE FATAL CASE IN A FULLING MILL, WHERE IT WAS PRESUMABLY USED WARM, IS BRIEFLY MENTIONED WITHOUT DETAILS ...

Non-Human Toxicity Excerpts:

>> INHALATION ... GUINEA PIGS ... IF THE EXPOSURE TIME TO 100 PPM WAS LIMITED TO 1 HR, NO SERIOUS DISTURBANCES RESULTED, EVEN THOUGH EYE & NOSE IRRITATION WAS STILL EVIDENT. ... INDICATED EVEN @ 35 PPM ALTHOUGH THERE WERE NO OTHER SIGNS OF ADVERSE EFFECTS AND NO DEATHS AFTER 13 1/2 HR OF CONTINUOUS EXPOSURE.

Non-Human Toxicity Values:

>> LD50 Mouse oral 136 mg/kg

National Toxicology Program Studies:

Reports from the National Toxicology Program, an interagency program supported by three government agencies (NIH, FDA, and CDC) within the Department of Health and Human Services. This program plays a critical role in generating, interpreting, and sharing toxicological information about chemicals of public health concerns.

>> Bis(2-chloroethyl) ether test results for heritable genetic effects in Drosophila in FY 1986: Sex-linked recessive lethal= positive; Reciprocal translocation= negative.

Populations at Special Risk:

>> Employees /with respiratory tract, liver, skin, or central nervous system diseases are/ at increased risk.

12. Ecological Information

Resident Soil (mg/kg)

>> 2.30e-01

Industrial Soil (mg/kg)

>> 1.00e+00

Resident Air (ug/m3)

>> 8.50e-03

Industrial Air (ug/m3)

>> 3.70e-02

Tapwater (ug/L)

>> 1.40e-02

MCL (ug/L)

>> 4.00e+00

Risk-based SSL (mg/kg)

>> 3.6e-06

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

>> 1.10e+00

Inhalation Unit Risk (ug/m3)-1

>> 3.30e-04

Volatile

>> Volatile

Mutagen

>> Mutagen

Fraction of Contaminant Absorbed in Gastrointestinal Tract

>> 1

Soil Saturation Concentration (mg/kg)

>> 5.05e+03

Sediment/Soil Concentrations:

Concentrations of this compound in sediment/soil.

>> Soil and sediment samples collected at Love Canal, NY contained bis(2-chloroethyl) ether, concn not quantified(1). Bis(2-chloroethyl)ether was qualitatively detected on-site and off-site at the Lipari Landfill Superfund site, Gloucester County, New Jersey in soil samples collected from 1983-1984(2).

Fish/Seafood Concentrations:

Concentrations of this compound in fish or seafood.

>> The concn of bis(2-chloroethyl) ether in oysters collected between May-June 1980 from areas of Lake Pontchartrain, LA, Inner Harbor Navigation Canal, averaged 0.6 ppb (wet weight) in 8 samples; in clams collected from Chef Manteur Pass and The Rigolets, bis(2-chloroethyl) ether not detected in composite samples(1). Bis(2-chloroethyl) ether was identified, but not quantified, in whole fish samples collected in the fall of 1983 from 13 Lake Michigan tributaries and Grand Traverse Bay(2). Bis(2-chloroethyl) ether was identified, but not quantified, in composite fish samples collected between 1980 and 1981 1983 from Great Lakes Harbors and Tributaries(2).

13. Disposal Considerations

Spillage Disposal

>> 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.

Disposal Methods

>> Generators of waste (equal to or greater than 100 kg/mo) containing this contaminant, EPA hazardous waste number U025, must conform with USEPA regulations in storage, transportation, treatment and disposal of waste.

>> A potential candidate for liquid injection incineration at a temperture range of 650 to 1,600 °C and a residence time 0.1 to 2 seconds. Also, 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. Also, 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.

>> Dichloroethyl ether is a waste chemical stream constituent which may be subjected to ultimate disposal by controlled 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.

>> PRECAUTIONS FOR "CARCINOGENS": There is no universal method of disposal that has been proved satisfactory for all carcinogenic compounds & specific methods of chem destruction ... published have not been tested on all kinds of carcinogen-containing waste. ... Summary of avail methods & recommendations ... /given/ must be treated as guide only. /Chemical Carcinogens/

>> For more Disposal Methods (Complete) data for BIS(2-CHLOROETHYL) ETHER (9 total), please visit the HSDB record page.

14. Transport Information

DOT

Dichloroethyl ether
6.1
UN Pack Group: II
Reportable Quantity of 10 lb or 4

IATA

Dichloroethyl ether
6.1, 3
UN Pack Group: II

15. Regulatory Information

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 due to exposure of bis(2-chloroethyl)ether through ingestion of contaminated water and contaminated aquatic organisms, the ambient water concentrations should be zero based on the non-threshold 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 1x10-5, 1x10-6, and 1x10-7. The corresponding recommended criteria are 0.30 ug/l, 0.030 ug/l, and 0.003 ug/l, respectively. If the above estimates are made for consumption of aquatic organisms only, excluding consumption of water, the levels are 13.6 ug/l, 1.36 ug/l, and 0.136 ug/l, respectively.

Regulatory Information

The Australian Inventory of Industrial Chemicals

>> Chemical: Ethane, 1,1'-oxybis[2-chloro-

REACH Registered Substance

>> Status: Active Update: 09-03-2022 https://echa.europa.eu/registration-dossier/-/registered-dossier/20699

>> Status: Active Update: 09-12-2020 https://echa.europa.eu/registration-dossier/-/registered-dossier/13909

New Zealand EPA Inventory of Chemical Status

>> Bis(2-chloroethyl) ether: HSNO Approval: HSR002958 Approved with controls

16. Other Information

Toxic Combustion Products:

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

>> MAY FORM PHOSGENE OR HYDROGEN CHLORIDE IN FIRES.

Other Safety Information

Chemical Assessment

>> IMAP assessments - Ethane, 1,1'-oxybis[2-chloro-: Human health tier II assessment

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