SAFETY DATA SHEET

Updated on 26/09/2024

1. Material Identification

Product Name : Ethylidene dichloride
Catalog Number : io-2372
CAS Number : 75-34-3
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]

>> H319 (100%): Causes serious eye irritation [Warning Serious eye damage/eye irritation]

>> H332 (12%): Harmful if inhaled [Warning Acute toxicity, inhalation]

>> H335 (100%): May cause respiratory irritation [Warning Specific target organ toxicity, single exposure; Respiratory tract irritation]

>> H412 (100%): Harmful to aquatic life with long lasting effects [Hazardous to the aquatic environment, long-term hazard]

Precautionary Statement Codes

>> P210, P233, P240, P241, P242, P243, P261, P264, P264+P265, P270, P271, P273, P280, P301+P317, P303+P361+P353, P304+P340, P305+P351+P338, P317, P319, P330, P337+P317, P370+P378, P403+P233, P403+P235, P405, and P501

NFPA 704 Diamond

NFPA Health Rating

>> 1 - Materials that, under emergency conditions, can cause significant irritation.

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

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

Health Hazards:

>> INHALATION: Irritation of respiratory tract. Salivation, sneezing, coughing, dizziness, nausea, and vomiting. EYES: Irritation, lacrimation, and reddening of conjunctiva. SKIN: Irritation. Prolonged or repeated skin contact can produce a slight burn. INGESTION: Ingestion incidental to industrial handling is not considered to be a problem. Swallowing of substantial amounts could cause nausea, vomiting, faintness, drowsiness, cyanosis, and circulatory failure. (USCG, 1999)

ERG 2024, Guide 130 (1,1-Dichloroethane)

>> May cause toxic effects if inhaled or absorbed through skin.

>> Inhalation or contact with material may irritate or burn skin and eyes.

>> 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.

>> Special Hazards of Combustion Products: When heated to decomposition emits highly toxic fumes to phosgene.

>> Behavior in Fire: Explosion hazard (USCG, 1999)

ERG 2024, Guide 130 (1,1-Dichloroethane)

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

>> 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 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. Gives off irritating or toxic fumes (or gases) in a fire. Vapour/air mixtures are explosive.

3. Composition/Information On Ingredients

Chemical name : Ethylidene dichloride
CAS Number : 75-34-3
Molecular Formula : C2H4Cl2
Molecular Weight : 98.9600 g/mol

4. First Aid Measures

First Aid:

>> EYES: First check the victim for contact lenses and remove if present. Flush victim's eyes with water or normal saline solution for 20 to 30 minutes while simultaneously calling a hospital or poison control center. Do not put any ointments, oils, or medication in the victim's eyes without specific instructions from a physician. IMMEDIATELY transport the victim after flushing eyes to a hospital even if no symptoms (such as redness or irritation) develop.

>> SKIN: IMMEDIATELY flood affected skin with water while removing and isolating all contaminated clothing. Gently wash all affected skin areas thoroughly with soap and water. If symptoms such as redness or irritation develop, IMMEDIATELY call a physician and be prepared to transport the victim to a hospital for treatment.

>> INHALATION: IMMEDIATELY leave the contaminated area; take deep breaths of fresh air. If symptoms (such as wheezing, coughing, shortness of breath, or burning in the mouth, throat, or chest) develop, call a physician and be prepared to transport the victim to a hospital. Provide proper respiratory protection to rescuers entering an unknown atmosphere.

Whenever possible, Self-Contained Breathing Apparatus (SCBA) should be used; if not available, use a level of protection greater than or equal to that advised under Protective Clothing.

>> INGESTION: DO NOT INDUCE VOMITING. Volatile chemicals have a high risk of being aspirated into the victim's lungs during vomiting which increases the medical problems. If the victim is conscious and not convulsing, give 1 or 2 glasses of water to dilute the chemical and IMMEDIATELY call a hospital or poison control center. IMMEDIATELY transport the victim to a hospital. If the victim is convulsing or unconscious, do not give anything by mouth, ensure that the victim's airway is open and lay the victim on his/her side with the head lower than the body. DO NOT INDUCE VOMITING. IMMEDIATELY transport the victim to a hospital. (NTP, 1992)

ERG 2024, Guide 130 (1,1-Dichloroethane)

>> 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.

First Aid Measures

Inhalation First Aid

>> Fresh air, rest. Refer for medical attention.

Skin First Aid

>> Remove contaminated clothes. Rinse skin with plenty of water or shower.

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. Refer 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. Containers may explode in fire. Storage containers and parts of containers may rocket great distances, in many directions.

>> Excerpt from ERG Guide 130 [Flammable Liquids (Water-Immiscible / Noxious)]:

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

>> SMALL FIRE: Dry chemical, CO2, water spray or regular foam. If regular foam is ineffective or unavailable, use alcohol-resistant foam.

>> LARGE FIRE: Water spray, fog or regular foam. If regular foam is ineffective or unavailable, use alcohol-resistant foam. Avoid aiming straight or solid streams directly onto the product. If it can be done safely, move undamaged containers away from the area around the fire.

>> 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. (ERG, 2024)

>> Use water spray, foam, powder, carbon dioxide. In case of fire: keep drums, etc., cool by spraying 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 130 [Flammable Liquids (Water-Immiscible / Noxious)]:

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

>> LARGE SPILL: Consider initial downwind evacuation for at least 300 meters (1000 feet).

>> 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 130 (1,1-Dichloroethane)

>> Immediate precautionary measure

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

>> Large Spill

>> Consider initial downwind evacuation for at least 300 meters (1000 feet).

>> 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.

>> Personal protection: self-contained breathing apparatus. Do NOT wash away into sewer. Collect leaking and spilled liquid in sealable containers as far as possible. Absorb remaining liquid in sand or inert absorbent. Then store and dispose of according to local regulations.

Accidental Release Measures

Public Safety: ERG 2024, Guide 130 (1,1-Dichloroethane)

>> 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 130 (1,1-Dichloroethane)

>> 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.

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

>> 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. See Chemical Dangers. Cool.

Storage Conditions:

>> Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

8. Exposure Control/ Personal Protection

REL-TWA (Time Weighted Average)

>> 100 ppm (400 mg/m³)

>> TWA 100 ppm (400 mg/m3) See Appendix C (Chloroethanes)

>> 100.0 [ppm]

PEL-TWA (8-Hour Time Weighted Average)

>> 100 ppm (400 mg/m³)

>> 100.0 [ppm]

>> 100 ppm as TWA; A4 (not classifiable as a human carcinogen).

TLV-TWA (Time Weighted Average)

>> 100 ppm [1990]

EU-OEL

>> 412 mg/m

MAK (Maximale Arbeitsplatz Konzentration)

>> 205 mg/m

Emergency Response: ERG 2024, Guide 130 (1,1-Dichloroethane)

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

>> Small Fire

>> Dry chemical, CO2, water spray or regular foam. If regular foam is ineffective or unavailable, use alcohol-resistant foam.

>> Large Fire

>> Water spray, fog or regular foam. If regular foam is ineffective or unavailable, use alcohol-resistant foam.

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

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

>> 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.

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 upper respiratory tract. The substance may cause effects on the central nervous system. Exposure at high levels could cause unconsciousness.

Effects of Long Term Exposure:

>> The substance defats the skin, which may cause dryness or cracking. The substance may have effects on the kidneys and liver.

Fire Prevention

>> NO open flames, NO sparks and NO smoking. Closed system, ventilation, explosion-proof electrical equipment and lighting. Do NOT use compressed air for filling, discharging, or handling.

Exposure Prevention

>> PREVENT GENERATION OF MISTS!

Inhalation Prevention

>> Use ventilation, local exhaust or breathing protection.

Skin Prevention

>> Protective gloves.

Eye Prevention

>> Wear safety spectacles.

Ingestion Prevention

>> Do not eat, drink, or smoke during work.

Exposure Control and Personal Protection

Protective Clothing: ERG 2024, Guide 130 (1,1-Dichloroethane)

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

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

Maximum Allowable Concentration (MAK)

>> 51.88 [ppm]

9. Physical And Chemical Properties

Molecular Weight:

>> 98.96

Exact Mass:

>> 97.9690055

Physical Description:

>> 1,1-dichloroethane appears as a colorless liquid with an ether-like odor. Slightly soluble in water and slightly denser than water. Flash point below 70 °F. Vapors denser than air. Used to make other chemicals.

>> COLOURLESS LIQUID WITH CHARACTERISTIC ODOUR.

Color/Form:

>> Colorless, oily liquid

Odor:

>> Aromatic ethereal odor

Taste:

The sensation of flavor perceived in the mouth and throat on contact with a substance.

>> As of chloroform

Boiling Point:

>> 135.1 °F at 760 mmHg (NTP, 1992)

>> 57 °C

Melting Point:

>> -143 °F (NTP, 1992)

>> -98 °C

Flash Point:

>> 22 °F (NTP, 1992)

>> -6 °C c.c.

Solubility:

>> less than 1 mg/mL at 68 °F (NTP, 1992)

>> Solubility in water, g/100ml at 20 °C: 0.6 (poor)

Density:

>> 1.174 at 68 °F (USCG, 1999) - Denser than water; will sink

>> Relative density (water = 1): 1.2

Vapor Density:

>> 3.44 (NTP, 1992) - Heavier than air; will sink (Relative to Air)

>> Relative vapor density (air = 1): 3.4

Vapor Pressure:

>> 234 mmHg at 77 °F ; 182 mmHg at 68 °F (NTP, 1992)

>> Vapor pressure, kPa at 20 °C: 24

LogP:

>> log Kow = 1.79

>> 1.8

Stability/Shelf Life:

>> Stable under recommended storage conditions.

Autoignition Temperature:

>> 856 °F (USCG, 1999)

>> 458 °C

Decomposition:

>> Hazardous decomposition products formed under fire conditions - Carbon oxides, Hydrogen chloride gas.

Viscosity:

>> 0.464 mPa s at 25 °C; 0.362 mPa s at 50 °C

Corrosivity:

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

>> Will attack some forms of plastics, rubber, and coatings.

Heat of Combustion:

>> -4,774 Btu/lb = -2,652 cal/g = -111X10+5 J/kg

Heat of Vaporization:

>> 131.6 Btu/lb = 73.1 cal/g = 3.06X10+5 J/kg

pH:

pH is an expression of hydrogen ion concentration in water. Specifically, pH is the negative logarithm of hydrogen ion (H+) concentration (mol/L) in an aqueous solution. The term is used to indicate basicity or acidity of a solution on a scale of 0 to 14, with pH 7 being neutral.

>> Neutral

Surface Tension:

>> 24.07 mN/m at 20 °C

Ionization Potential:

>> 11.06 eV

Odor Threshold:

>> Odor Threshold Low: 49.0 [mmHg]

>> Odor Threshold High: 1359.0 [mmHg]

>> Odor threshold from AIHA

Refractive Index:

>> Index of refraction: 1.4167 at 20 °C

Relative Evaporation Rate:

The rate at which a material will vaporize (evaporate, change from liquid to vapor), compared to the rate of vaporization of a specific known material.

>> 11.6 (Butyl acetate = 1)

10. Stability And Reactivity

>> Highly flammable. Slightly soluble in water.

>> Highly Flammable

11. Toxicological Information

Toxicity Summary:

>> IDENTIFICATION AND USE: 1,1-Dichloroethane is a colorless, oily liquid. It is used as a chemical intermediate in the production of vinyl chloride and of 1,1,1-trichloroethane. It is also a grain fumigant and has limited use as a solvent for plastics, oils, fats, paint, and varnishes. 1,1-Dichloroethane is used in the manufacture of high vacuum rubber and silicone grease. The chemical can also be used as a coupling agent in antiknock gasoline, for metal degreasing, organic synthesis, and ore floatation. It was formerly used as an anesthetic but it is of no importance in this field today. HUMAN STUDIES: Symptoms of exposure to this compound may include liver and kidney damage, skin and eye irritation, dermatitis, skin burns, unconsciousness, CNS depression, drowsiness, nausea, vomiting, faintness, irritation of the respiratory tract, salivation, sneezing, coughing, dizziness, lacrimation, reddening of the conjunctiva, cyanosis, and circulatory failure. ANIMAL STUDIES: No toxic effects were observed in rabbits dermally exposed to an upper limit dose of 2 mL 1,1-dichloroethane/kg bw for 24 hr during a 14-day observation period. In a study of acute toxicity to adult male rats, there was significant mortality at a concentration of 8.0 g/kg. Intraperitoneal doses of 1000 mg/kg produced no renal necrosis in mice but some evidence of tubular swelling was reported. Urinary protein was increased after injection of 2000 mg/kg and urinary glucose increased after 4000 mg/kg. Rats survived an 8 hr inhalation exposure to 4000 ppm but were killed at 16,000 ppm. Anesthetic effects in mice that inhaled 8,000-10,000 ppm 1,1-dichloroethane for 2 hours were observed, with a minimal lethal dose of 17,300 ppm. Single intraperitoneal injections of 150, 300, 500, and 750 mg 1,1-dichloroethane/kg bw to guinea pigs failed to elicit a change in serum ornithine carbamoyl transferase activity and produced no histological changes in the liver. Pregnant female rats were exposed on days 6 to 15 of gestation to 3800 or 6000 ppm 1,1-dichloroethane vapors, 7 hr/day. No effect occurred in either the dams or fetuses

except for slight but statistically significant decreases in food consumption and weight gain by the dams and delayed ossification in the fetuses. No teratological effects were related to exposures. Liver weights of a group of nonpregnant rats were increased by similar exposure, but no histological changes were apparent grossly or microscopically. Chronic 1,1-dichloroethane exposure led to increased incidence of mammary gland adenocarcinomas and hemangiosarcomas in female rats and an increased incidence of hepatocellular carcinomas and benign uterine polyps in mice. 1,1-Dichloroethane has a genotoxic potential as measured by the bone marrow chromosomal aberrations and micronuclei formation tests in mice. Test for cytogenetic effects in cultured Chinese hamster ovary cells indicated that 1,1-dichloroethane induced sister-chromatid exchanges, but did not cause an increase in the number of chromosomal aberrations either with or without metabolic activation. It was not mutagenic in Salmonella/microsome test (Ames test). ECOTOXICITY STUDIES: Effects of a series of chlorinated ethenes and ethanes on hybrid poplar (Populus deltoides x nigra DN34) were assessed in laboratory experiments. Adverse effects were found to increase with increasing number of chlorine atoms within a homologous series of ethenes or ethanes. Ethenes were more toxic than similarly chlorinated ethanes.

EPA Provisional Peer-Reviewed Toxicity Values:

This section provides the EPA Provisional Peer-Reviewed Toxicity Values (PPRTVs) and links of related assessment documents.

Chemical Substance

>> 1,1-Dichloroethane

Reference Dose (RfD), Chronic

>> 2 x 10^-1 mg/kg-day

Reference Dose (RfD), Subchronic

>> 2 mg/kg-day

PPRTV Assessment

>> PDF Document

Weight-Of-Evidence (WOE)

>> See the IRIS entry for 1,1-Dichloroethane

Last Revision

>> 2006

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

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

Chemical

>> 1,1-Dichloroethane

USGS Parameter Code

>> 34496

Noncancer HBSL (Health-Based Screening Level)[µg/L]

>> 1000

Benchmark Remarks

>> Based on PPRTV

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).

>> CLASSIFICATION: C; possible human carcinogen. BASIS FOR CLASSIFICATION: Based on no human data and limited evidence of carcinogenicity in two animal species (rats and mice) as shown by an increased incidence of mammary gland adenocarcinomas and hemangiosarcomas in female rats and an increased incidence of hepatocellular carcinomas and benign uterine polyps in mice. HUMAN CARCINOGENICITY DATA: None. ANIMAL CARCINOGENICITY DATA: Limited.

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).

>> No indication of carcinogenicity (not listed by IARC). (L135)

Health Effects:

>> 1,1-dichloroethane can cause kidney disease after long-term, high-level exposure in the air. It is also known to cause liver damage, as well as central nervous system depression. 1,1-Dichloroethane can cause dermatitis on prolonged dermal exposure. (L403, T65)

Exposure Routes:

>> The substance can be absorbed into the body by inhalation and by ingestion.

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

Inhalation Exposure

>> Dizziness. Drowsiness. Lethargy. Nausea. Unconsciousness.

Skin Exposure

>> Dry skin. Roughness.

Eye Exposure

>> Redness. Pain.

Ingestion Exposure

>> Burning sensation. Further see Inhalation.

>> irritation skin; central nervous system depression; liver, kidney, lung damage

Target Organs:

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

>> Neurological (Nervous System), Renal

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.

>> Nephrotoxin - The chemical is potentially toxic to the kidneys in the occupational setting.

>> ACGIH Carcinogen - Not Classifiable.

Toxicity Data:

>> LC50 (rat) = 13,000 ppm/4hr

Treatment:

Treatment when exposed to toxin

>> Following oral exposure, immediately dilute with 4 to 8 ounces (120 to 240 mL) of water or milk and administer charcoal as a slurry (240 mL water/30 g charcoal). Consider insertion of a small, flexible nasogastric or orogastric tube to suction gastric contents after recent large ingestions (the risk of further mucosal injury must be weighed against potential benefits). Following inhalation exposure, Move patient to fresh air. Monitor for respiratory distress. If cough or difficulty breathing develops, evaluate for respiratory tract irritation, bronchitis, or pneumonitis. After eye exposure, irrigate exposed eyes with copious amounts of room temperature water for at least 15 minutes. If the exposure occurs through dermal contact, remove contaminated clothing and wash exposed area thoroughly with soap and water. In any case, a physician may need to examine the area if irritation or pain persists. (T36)

Interactions:

>> Drinking water chlorination results in numerous chlorinated byproducts. We evaluated the developmental and embryo toxicity of 1,3-dichloropropane (1,3DP), 2,2-dichloropropane (2,2DP), 1,1-dichloroethane (1,1DE) and 1,1,2,2-tetrachloroethane (TCE) in rat whole embryo culture (WEC) due to their presence in chlorinated drinking water, their structural similarities, and a lack of developmental toxicity data for these compounds. Humans could be exposed to these four chlorinated propanes and ethanes (CPEs) simultaneously in drinking water and hence we evaluated them alone and in combination. Toxicity profiles were generated by exposing gestational day (GD) 9.5 rat embryos in WEC to the CPEs for 48 hours. The individual CPEs were all dysmorphogenic in WEC and embryonic exposure resulted primarily in rotation and heart defects. The embryonic effects from exposure were compared based on developmental score (DEVSC), death and dysmorphology as the parameters of comparison. Concentrations of individual CPEs chosen for the

mixture studies were predicted to produce DEVSCs 25% below control values. These equipotent mM concentrations (14.5 1,1DE, 1.5 TCE, 16 2,2DP, 5.5 1,3DP) were then used to determine the toxicity of all possible combinations, based on a dose-additivity model, of the four CPEs. Eight of mixture combinations gave experimental DEVSCs which were not significantly different from the predicted scores while three of the mixtures (1,3DP/2,2DP; TCE/1,3DP/2,2DP; TCE/1,3DP/2,2DP/1,1DE) gave scores which were significantly lower than predicted. Embryo mortality was additive in ten of the eleven treatment groups, with one mixture significantly more embryotoxic (27% mortality) than predicted. Dysmorphology was significantly elevated in all treatment groups compared to controls and was neither significantly different between the groups nor different from dysmorphology seen in embryos following exposure to the individual compounds. These data suggest that the developmental toxicity of these halogenated propanes and ethanes is additive.

Antidote and Emergency Treatment:

>> /SRP:/ 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. /Halogenated aliphatic hydrocarbons and related compounds/

Human Toxicity Excerpts:

>> /SIGNS AND SYMPTOMS/ It is /CNS depressant/ in high concentrations. It may also have anesthetic effects at high concentrations. It is a lacrimator.

Non-Human Toxicity Excerpts:

>> /LABORATORY ANIMALS: Acute Exposure/ In a study, ... adult male Sprague-Dawley rats were given single doses of 0, 0.5, 1.0, 2.0, 4.0, and 8.0 g/kg in corn oil. There was significant mortality only at 8.0 g/kg and no evidence of treatment-related effects on serum or urinary enzyme levels, organ weights, or tissue morphology.

Non-Human Toxicity Values:

>> LC50 Mouse inhalation 17300 ppm/2 hr

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.

>> A bioassay of technical grade 1,1-dichloroethane for possible carcinogenicity was conducted using Osborne-Mendel rats and B6C3F1 mice. 1,1-Dichloroethane in corn oil was admin by gavage,at either of two dosages, to groups of 50 male and 50 female animals of each species, 5 days/wk for a period of 78 wk, followed by an observation period of 33 wk for rats and 13 wk for mice. ... The high and low time weighted avg doses of 1,1-dichloroethane were, respectively, 764 and 382 mg/kg/day for male rats; 950 and 475 mg/kg/day for female rats; 2,885 and 1,442 mg/kg/day for male mice; and 3,331 and 1,665 mg/kg/day for female mice. For each species, 20 animals of each sex were placed on test as vehicle controls. These animals were gavaged with corn oil at the same times that dosed animals were gavaged with 1,1-dichloroethane mixtures. Twenty animals of each sex were placed on test as untreated controls for each species. These animals were not intubated. ... There were dose related marginal incr in mammary adenocarcinomas and hemangiosarcomas among female rats and there was a statistically significant incr in the incidence of endometrial stromal polyps among dosed female mice as compared to controls. These findings are indicative of the possible carcinogenic potential of the test cmpd. However, it must be recognized that under the conditions of this bioassay there was no conclusive evidence for the carcinogenicity of 1,1-dichloroethane in Osborne-Mendel rats or B6C3F1 mice. Levels of Evidence of Carcinogenicity: Male Rats: Negative; Female Rats: Equivocal; Male Mice: Negative; Female Mice: Equivocal.

TSCA Test Submissions:

Under the Toxic Substances Control Act (TSCA), EPA has broad authority to issue regulations designed to require manufacturers (including importers) or processors to test chemical substances and mixtures for health and environmental effects. This section provides information on test reports submitted for this chemical under TSCA.

>> The ability of 1,1-dichloroethane to induce morphological transformation in the BALB/3T3 mouse cell line (Cell Transformation Assay) was evaluated. Based on preliminary clonal toxicity determinations (exposure time=1 day), 1,1-dichloroethane was tested at concentrations of 0, 4, 20, 100 and 250 ug/ml with cell survival ranging from 117% to 103% of untreated controls. The test compound did not induce significantly greater transformation frequencies than controls.

Populations at Special Risk:

>> Persons with existing skin disorders may be more susceptible to the effects of this agent. ... Chronic respiratory disease: In persons with impaired pulmonary function, especially those with obstructive airway diseases, the breathing of 1,1-dichloroethane might cause exacerbation of symptoms due to its irritant properties.

12. Ecological Information

Resident Soil (mg/kg)

>> 3.60e+00

Industrial Soil (mg/kg)

>> 1.60e+01

Resident Air (ug/m3)

>> 1.80e+00

Industrial Air (ug/m3)

>> 7.70e+00

Tapwater (ug/L)

>> 2.80e+00

MCL (ug/L)

>> 7.50e+01

Risk-based SSL (mg/kg)

>> 7.80e-04

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

>> 5.70e-03

Inhalation Unit Risk (ug/m3)-1

>> 1.6e-06

Chronic Oral Reference Dose (mg/kg-day)

>> 2.00e-01

Volatile

>> Volatile

Mutagen

>> Mutagen

Fraction of Contaminant Absorbed in Gastrointestinal Tract

>> 1

Soil Saturation Concentration (mg/kg)

>> 1.69e+03

ICSC Environmental Data:

>> The substance is harmful to aquatic organisms. The substance may cause long-term effects in the aquatic environment.

Sediment/Soil Concentrations:

Concentrations of this compound in sediment/soil.

>> SEDIMENT: 1,1-Dichloroethane was not detected in bottom sediment of the submarine outfall region of the Los Angeles County (JWPCP) municipal wastewater treatment plant at a detection limit of 0.5 ppb(1). It was detected, not quantified in Love Canal, NY sediment samples(2).

Fish/Seafood Concentrations:

Concentrations of this compound in fish or seafood.

>> 1,1-Dichloroethane was not detected (detection limit 0.3 ppb) in whole invertebrates, fish liver, or shrimp muscle obtained from a station off the submarine outfall of the Los Angeles County (JWPCP) municipal treatment plant(1). In shellfish samples from Lake Pontchartrain, New Orleans, the Mississippi River delta, the mean concentration in oysters was 33 parts per trillion(2); not detected in clams(2).

13. Disposal Considerations

Spillage Disposal

>> Personal protection: self-contained breathing apparatus. Do NOT wash away into sewer. Collect leaking and spilled liquid in sealable containers as far as possible. Absorb remaining liquid in sand or inert absorbent. Then store and dispose of according to local regulations.

Disposal Methods

>> Generators of waste (equal to or greater than 100 kg/mo) containing this contaminant, EPA hazardous waste number U076, must conform with USEPA regulations in storage, transportation, treatment and disposal of waste.

>> Product: Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material; Contaminated packaging: Dispose of as unused product.

>> Potential candidate for liquid injection incineration, with a temperature range of 650 to 1,600 °C and a residence time of 0.1 to 2 seconds. Also a potential candidate for rotary kiln incineration, with a temperature range of 820 to 1600 °C and a residence time of seconds. Also a potential candidate for fluidized bed incineration, with a temperature range of 450 to 980 °C and a residence time of seconds.

>> The following wastewater treatment technologies have been investigated for 1,1-dichloroethane: Concentration process: Stripping.

>> For more Disposal Methods (Complete) data for 1,1-Dichloroethane (10 total), please visit the HSDB record page.

>> SRP: Recycle any unused portion of the material for its approved use or return it to the manufacturer or supplier. Ultimate disposal of the chemical must consider: the material's impact on air quality; potential migration in air, soil or water; effects on animal, aquatic and plant life; and conformance with environmental and public health regulations. If it is possible or reasonable use an alternative chemical product with less inherent propensity for occupational harm/injury/toxicity or environmental contamination.

14. Transport Information

DOT

Ethylidene dichloride
3
UN Pack Group: II
Reportable Quantity of 1000 lb or 454 kg

IATA

Ethylidene dichloride
3,
UN Pack Group: II

15. Regulatory Information

State Drinking Water Standards:

State drinking water standards (e.g. maximum containment level (MCL)) for this chemical. These standards are legally enforceable.

>> (CA) CALIFORNIA 5 ug/L

TSCA Requirements:

This section provides information on requirements concerning this chemical under the Toxic Substances Control Act (TSCA) of 1976. TSCA provides EPA with authority to require reporting, record-keeping and testing requirements, and restrictions relating to chemical substances and/or mixtures. Certain substances are generally excluded from TSCA, including, among others, food, drugs, cosmetics and pesticides.

>> Pursuant to section 8(d) of TSCA, EPA promulgated a model Health and Safety Data Reporting Rule. The section 8(d) model rule requires manufacturers, importers, and processors of listed chemical substances and mixtures to submit to EPA copies and lists of unpublished health and safety studies. 1,1-Dichloroethane is included on this list. Effective date: 6/1/87; Sunset date: 6/1/97.

Regulatory Information

The Australian Inventory of Industrial Chemicals

>> Chemical: Ethane, 1,1-dichloro-

New Zealand EPA Inventory of Chemical Status

>> Ethane, 1,1-dichloro-: HSNO Approval: HSR001250 Approved with controls

16. Other Information

Toxic Combustion Products:

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

>> When heated to decomposition, it emits highly toxic fumes of phosgene and /chloride/.

Other Safety Information

Chemical Assessment

>> IMAP assessments - Ethane, 1,1-dichloro-: Human health tier II assessment

"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."