SAFETY DATA SHEET

Updated on 25/12/2024

1. Material Identification

Product Name : 1,3-Dichloropropane
Catalog Number : io-2185
CAS Number : 142-28-9
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)

Note

>> Pictograms displayed are for 99.2% (123 of 124) of reports that indicate hazard statements. This chemical does not meet GHS hazard criteria for 0.8% (1 of 124) of reports.

Pictogram(s)

GHS Hazard Statements

>> H225 (23.4%): Highly Flammable liquid and vapor [Danger Flammable liquids]

>> H226 (76.6%): Flammable liquid and vapor [Warning Flammable liquids]

>> H317 (70.2%): May cause an allergic skin reaction [Warning Sensitization, Skin]

>> H319 (74.2%): Causes serious eye irritation [Warning Serious eye damage/eye irritation]

>> H412 (83.9%): 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+P265, P272, P273, P280, P302+P352, P303+P361+P353, P305+P351+P338, P321, P333+P317, P337+P317, P362+P364, P370+P378, P403+P235, and P501

Health Hazards:

>> INHALATION: May cause some central nervous system depression. EYES: May cause some pain and irritation. SKIN: Mild irritation. (USCG, 1999)

>> Special Hazards of Combustion Products: Emits fumes of phosgene.

>> Behavior in Fire: Reacts vigorously. (USCG, 1999)

>> Highly flammable. Gives off irritating or toxic fumes (or gases) in a fire. Above 16 °C explosive vapour/air mixtures may be formed.

3. Composition/Information On Ingredients

Chemical name : 1,3-Dichloropropane
CAS Number : 142-28-9
Molecular Formula : C3H6Cl2
Molecular Weight : 112.9800 g/mol

4. First Aid Measures

First Aid:

>> Call a doctor.

>> INHALATION: Remove to fresh air. If breathing has stopped, give artificial respiration.

>> EYES: Flush with running water for 15 minutes.

>> SKIN: Wash thoroughly with soap and water.

>> INGESTION: Gastric lavage or emesis and catharsis. (USCG, 1999)

First Aid Measures

Inhalation First Aid

>> Fresh air, rest.

Skin First Aid

>> First rinse with plenty of water for at least 15 minutes, then remove contaminated clothes and rinse again.

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. Do NOT induce vomiting.

5. Fire Fighting Measures

>> Flash back along vapor trail may occur.

>> Fire Extinguishing Agents: Foam, carbon dioxide, dry chemical. (USCG, 1999)

>> Use water spray, powder, foam, 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 128 [Flammable Liquids (Water-Immiscible)]:

>> 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)

Spillage Disposal:

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

>> Evacuate danger area! Ventilation. 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. Do NOT wash away into sewer. Personal protection: filter respirator for organic gases and vapours adapted to the airborne concentration of the substance.

7. Handling And Storage

Safe Storage:

>> Separated from food and feedstuffs, oxidants, acids, bases and alumina. Cool. Well closed. Keep in a well-ventilated room.

8. Exposure Control/ Personal Protection

Inhalation Risk:

>> No indication can be given about the rate at which a harmful concentration of this substance in the air is reached on evaporation at 20 °C.

Effects of Short Term Exposure:

>> The substance is irritating to the eyes, skin and respiratory tract.

Fire Prevention

>> NO open flames, NO sparks and NO smoking. Above 16 °C use a closed system, ventilation and explosion-proof electrical equipment.

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.

9. Physical And Chemical Properties

Molecular Weight:

>> 112.98

Exact Mass:

>> 111.9846556

Physical Description:

>> 1,3-dichloropropane is a colorless watery liquid with a sweet odor. Sinks in water. Produces irritating vapor. (USCG, 1999)

>> COLOURLESS LIQUID WITH CHARACTERISTIC ODOUR.

Color/Form:

>> Colorless liquid

Odor:

>> Sweet

Boiling Point:

>> 248.7 °F at 760 mmHg (USCG, 1999)

>> 120 °C

Melting Point:

>> -147.1 °F (USCG, 1999)

>> -99 °C

Flash Point:

>> 70 °F (est.) (USCG, 1999)

>> 16 °C o.c.

Solubility:

>> Sol in benzene, chloroform, alcohol, ether

>> Solubility in water, g/100ml at 20 °C: 0.3

Density:

>> 1.1878 at 68 °F (USCG, 1999) - Denser than water; will sink

>> Relative density (water = 1): 1.19

Vapor Density:

>> 3.90 (air= 1)

>> Relative vapor density (air = 1): 3.9

Vapor Pressure:

>> 18.2 [mmHg]

>> Vapor pressure, kPa at 20 °C: 2.4

LogP:

>> log Kow = 2.00

>> 2.0

Decomposition:

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

Heat of Combustion:

>> -3709 cal/g

Heat of Vaporization:

>> At boiling point 71.71 cal/g

Surface Tension:

>> 33.93 dynes/cm at 20 °C

Refractive Index:

>> Index of refraction: 1.4487 @ 20 °C/D

10. Stability And Reactivity

>> Highly flammable.

>> Highly Flammable

11. Toxicological Information

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

>> 1,3-Dichloropropane

Reference Dose (RfD), Chronic

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

Reference Dose (RfD), Subchronic

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

PPRTV Assessment

>> PDF Document

Weight-Of-Evidence (WOE)

>> Inadequate information to assess carcinogenic potential

Last Revision

>> 2006

RAIS Toxicity Values:

This section provides the Chemical toxicity information from the Risk Assessment Information System.

Oral Chronic Reference Dose (RfDoc) (mg/kg-day)

>> 0.02

Oral Chronic Reference Dose Reference

>> PPRTV Current

Oral Subchronic Chronic Reference Dose (RfDos) (mg/kg-day)

>> 0.2

Oral Subchronic Chronic Reference Dose Reference

>> PPRTV Current

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

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

Chemical

>> 1,3-Dichloropropane

USGS Parameter Code

>> 77173

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

>> 100

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

Exposure Routes:

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

Inhalation Exposure

>> Dizziness.

Skin Exposure

>> Redness. Pain.

Eye Exposure

>> Redness. Pain.

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.

Antidote and Emergency Treatment:

>> 1. FLUSH contaminating fumigants from the skin and eyse with copious amounts of water or saline for at least 15 minutes. Some fumigants are corrosive to the cornea and may cause BLINDNESS. Specialized medical treatment should be obtained promptly following removal of toxicant by copious flushing with clean water. Skin contamination may cause BLISTERING and deep chemical burns. Absorption of some fumigants across the skin may be sufficient to cause systemic poisoning in the absence of fumigant inhalation. For all these reasons, decontamination of eyes and skin must must be IMMEDIATE and THROUGH. 2. REMOVE victims of fumigant inhalation to FRESH AIR immediately. Even though initial symptoms and signs are mild, keep the victim quiet, in a semi-reclining position. Minimum pohysical activity limits the likehood ofpulmonary edema. 3. If victim is not breathing, clear the airway of secretions and RESUSCITATE with positive poressure oxygen apparatus. If this is not available, use chest compression to sustain respiration. If victim is pulseless, employ cardiac resuscitation. 4. If PULMONARY EDEMA is evident, there are several measures avilable to sustain life. Medical judgement must be relied upon, however, in the management of each case. The following procedures are generally recommended: A. Put the victim in a SITTING position with a backrest. B. Use intermittent and/or continuous positive pressure OXYGEN to relieve hypoxemia. ... C. Slowly administer FUROSEMIDE, 40 mg, or SODIUM ETHACRYNATE, 50 mg, to reduce venous load by inducing diuresis. ... D. Morphine in small doses (5-10 mg), slowly, iv to allay anxiety and promote deeper respiratory excursions. E. Administer AMINOPHYLLINE (0.25-0.50 gm) slowly, iv. ... F. Digitalization may be considered, but there is a serious risk of arrhythmias in an anoxic and toxic myocardium. G. TRACHEOSTOMY may be necessary in some cases to facilitate aspiration of large amounts of pulmonary edema fluid. H. Epinephrine, atorpine, and expectorants are generally not helpful, and may complicate treatment. I. Watch for RECURRENT PULMONARY EDEMA, even up to 2 weeks after the initial episode. Limit victim's physical activity for at least 4 weeks. Severe physical weakness usually indicates persistent pulmonary injury. Serial pulmonary function testing may be useful in assessing recovery. 5. Combat SHOCK by placing victim in the Trendelenburg position and administering plasma, whole blood, and/or electrolyte and glucose solutions intravenously, with great care, to avoid pulmonary edema. Central venous pressure should be monitored continously. Vasopressor amines must be given with great caution, because of the irritability of the myocardium. 6. Control CONVULSIONS. Seizures are most likely to occur in poisonings by methyl bromide, hydrogen cyanide, acrylonitrile, phosphine, and carbon disulfide. ... /Fumigant poisoning/

Human Toxicity Excerpts:

>> Bronchospasm may result from inhalation of high concentrations. /Dichloropropene and dichloropropane/ Liver, kidney, and cardiac toxicity is probably similar to that produced by carbon tetrachloride.

Non-Human Toxicity Excerpts:

>> The acute, short term and long term toxicity of orally administered 1,2-dichloropropane was studied in male rats. The chemical was applied by gavage for the acute and short term studies at doses of 0, 100, 250, 500, or 1000 mg dichloropropane/kg in corn oil once daily for up to 10 consecutive days. Although ingestion of dichloropropane caused body weight loss and central nervous system depression, few other toxic effects were manifest 24 hours after a single dose of the chemical. Morphologic changes were limited to liver centrilobular cells in 500 and 1000 mg/kg rats. Hepatic nonprotein sulfhydryl levels were decreased and renal nonprotein sulfhydryl levels were increased at 24 hr. In the short term study resistance developed to dichloropropane hepatotoxicity over the 10 consecutive days of exposure, as reflected by progressively lower serum enzyme levels and by decreases in the severity and incidence of toxic hepatitis and periportal vacuolization. Nucleolar enlargement in hepatocytes was observed at all dosage levels at 5 and 10 days. Manifestations of hemolytic anemia were observed; these included erythrophagocytosis in the liver, splenic hemosiderosis and hyperplasia of erythropoietic elements of the red pulp, renal tubular cell hemosiderosis, and hyperbilirubinemia. Nephrotoxicity was absent. In the long term study, rats initially weighing 180 to 200 g were gavaged 5 times weekly for up to 13 weeks with 0, 100, 250, 500, or 750 mg dichloropropane/kg. Over half of the 750 mg/kg group died within 10 days. Histopathologic changes in the survivors of the 750 mg/kg group included mild hepatitis and splenic hemosiderosis, adrenal medullary vacuolization and cortical lipidosis, testicular degeneration and reduction in sperm, and increased number of degenerate spermatogonia in the epididymis. Similar testicular and epididymal degenerative changes were observed in some 500 mg/kg animals after 13 weeks of dosing. In the 500 mg/kg group, >50% were dead by 13 weeks. No deaths occurred in the 100 or 250 mg/kg groups. Slight elevations in serum ornithine-carbamyl transferase activity, periportal vacuolization, and active hepatic fibroplasia were seen in the 500 mg/kg group. Dose dependent elevations in serum bilirubin were noted and at 10 and 12 weeks, the increases were statistically significant in the 100 mg/kg group. Hemosiderosis and hyperplasia of the erythropoietic elements of the spleen were present in most dichloropropane dosed animals at all exposure levels. Liver/body weight and spleen/body weight ratios were higher, while hematocrit and hemoglobin levels were significantly lower, than those of controls in the 250 and 500 mg/kg animals. The effects of the long term dosage regimen largely disappeared during a one week recovery period.

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.

>> Toxicity of 1,3-dichloropropane (DCP) with respect to testicular changes was evaluated in male albino Wistar rats (10/treated group, 20 in arachis oil vehicle control group) exposed orally to DCP by gavage at dosage levels of 0, 100 or 400 mg/kg/day for 14 days. On day 15, the animals were sent for pathological examination. No significant differences between treated and control animals were observed in the following: maternal mortality, clinical observations, body weights and weight gain, testes weights, morphology, or detailed macroscopic and microscopic examination of the kidneys, testes, epididymides, ductuli efferentes, and vasa deferentes.

12. Ecological Information

Resident Soil (mg/kg)

>> 1.60e+03

Industrial Soil (mg/kg)

>> 2.30e+04

Tapwater (ug/L)

>> 3.70e+02

MCL (ug/L)

>> 5.00e+00

Risk-based SSL (mg/kg)

>> 1.30e-01

Chronic Oral Reference Dose (mg/kg-day)

>> 2.00e-02

Volatile

>> Volatile

Mutagen

>> Mutagen

Fraction of Contaminant Absorbed in Gastrointestinal Tract

>> 1

Soil Saturation Concentration (mg/kg)

>> 1.49e+03

Fraction of Contaminant Absorbed Dermally from Soil

>> 0.1

Sediment/Soil Concentrations:

Concentrations of this compound in sediment/soil.

>> Dichloropropanes were identified, not quantified, in 1 of 352 samples in the USEPA's STORET data base(1). 1,2-Dichloropropane was present in concns up to 12.2 ppb throughout much of soil core underlying recently fumigated field in California(2). 1,2-Dichloropropane was not detected in boring in Anoka sandplain near Minneapolis and upgradient of an asphalt-lined municipal solid waste landfill which had polluted groundwater, but 2.0 ppb was found in clay boring upgradient of landfill in SW Minnesota which had contaminated the groundwater(3). Dichloropropane (unspecified isomer) was detected in Love Canal, NY sediment/soil/water samples(4). 1,2-Dichloropropane was found in soil cores in California as far as 7 m down at 0.2-2.2 ppb(5).

Fish/Seafood Concentrations:

Concentrations of this compound in fish or seafood.

>> Biota conentrations reported in the USEPA's STORET data base, 1980-1982 94 samples 0% pos(1).

13. Disposal Considerations

Spillage Disposal

>> Evacuate danger area! Ventilation. 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. Do NOT wash away into sewer. Personal protection: filter respirator for organic gases and vapours adapted to the airborne concentration of the substance.

Disposal Methods

>> SRP: At the time of review, criteria for land treatment or burial (sanitary landfill) disposal practices are subject to significant revision. Prior to implementing land disposal of waste residue (including waste sludge), consult with environmental regulatory agencies for guidance on acceptable disposal practices.

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14. Transport Information

DOT

1,3-Dichloropropane
3
UN Pack Group: II
Reportable Quantity of 1000 lb or 454 kg

IATA

1,3-Dichloropropane
3, 6.1
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.

>> Toxic pollutant designated pursuant to section 307(a)(1) of the Federal Water Pollution Control Act and is subject to effluent limitations.

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. Propane, 1,3-dichloro- is included on this list.

Regulatory Information

The Australian Inventory of Industrial Chemicals

>> Chemical: Propane, 1,3-dichloro-

California Safe Cosmetics Program (CSCP) Reportable Ingredient

>> Hazard Traits - Environmental tox

>> Authoritative List - CWA 303(d)

>> Report - if used as a fragrance or flavor ingredient

REACH Registered Substance

>> Status: Active Update: 31-05-2018 https://echa.europa.eu/registration-dossier/-/registered-dossier/25727

New Zealand EPA Inventory of Chemical Status

>> 1,3-Dichloropropane: Does not have an individual approval but may be used under an appropriate group standard

New Zealand EPA Inventory of Chemical Status

>> Propane, dichloro-: 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.

>> When heated to decomposition it emits highly toxic fumes of /hydrogen chloride/ & phosgene.

"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."