ionz

SAFETY DATA SHEET

Updated on 26/09/2024

1. Material Identification

Product Name : 1,4-Dichlorobenzene
Catalog Number : io-2143
CAS Number : 106-46-7
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)

>> Warning

GHS Hazard Statements

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

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

>> H400 (90.8%): Very toxic to aquatic life [Warning Hazardous to the aquatic environment, acute hazard]

>> H410 (100%): Very toxic to aquatic life with long lasting effects [Warning Hazardous to the aquatic environment, long-term hazard]

Precautionary Statement Codes

>> P203, P264+P265, P273, P280, P305+P351+P338, P318, P337+P317, P391, 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:

>> INHALATION: irritation of upper respiratory tract; over- exposure may cause depression and injury to liver and kidney. EYE CONTACT: pain and mild irritation. (USCG, 1999)

>> Special Hazards of Combustion Products: Vapors are irritating. Toxic chlorine, hydrogen chloride, and phosgene gases may be generated in fires. (USCG, 1999)

>> Combustible. Gives off irritating or toxic fumes (or gases) in a fire. Above 66 °C explosive vapour/air mixtures may be formed. Finely dispersed particles form explosive mixtures in air.

3. Composition/Information On Ingredients

Chemical name : 1,4-Dichlorobenzene
CAS Number : 106-46-7
Molecular Formula : C6H4Cl2
Molecular Weight : 147.0000 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. IMMEDIATELY call a physician and be prepared to transport the victim to a hospital even if no symptoms (such as wheezing, coughing, shortness of breath, or burning in the mouth, throat, or chest) develop. 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. 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. Be prepared to transport the victim to a hospital if advised by a physician. 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.

>> OTHER: Since this chemical is a known or suspected carcinogen you should contact a physician for advice regarding the possible long term health effects and potential recommendation for medical monitoring. Recommendations from the physician will depend upon the specific compound, its chemical, physical and toxicity properties, the exposure level, length of exposure, and the route of exposure. (NTP, 1992)

First Aid Measures

Inhalation First Aid

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

Skin First Aid

>> Remove contaminated clothes. Rinse and then wash skin with water and soap.

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

>> Give one or two glasses of water to drink. Refer for medical attention .

5. Fire Fighting Measures

>> Excerpt from ERG Guide 171 [Substances (Low to Moderate Hazard)]:

>> CAUTION: Fire involving Safety devices (UN3268) and Fire suppressant dispersing devices (UN3559) may have a delayed activation and a risk of hazardous projectiles. Extinguish the fire at a safe distance.

>> SMALL FIRE: Dry chemical, CO2, water spray or regular foam.

>> LARGE FIRE: Water spray, fog or regular foam. Do not scatter spilled material with high-pressure water streams. If it can be done safely, move undamaged containers away from the area around the fire. Dike runoff from fire control for later disposal.

>> FIRE INVOLVING TANKS: 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. (ERG, 2024)

>> 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 171 [Substances (Low to Moderate Hazard)]:

>> 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)

Spillage Disposal:

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

>> Personal protection: filter respirator for organic gases and particulates adapted to the airborne concentration of the substance. Do NOT let this chemical enter the environment. Sweep spilled substance into covered containers. If appropriate, moisten first to prevent dusting. Carefully collect remainder. Then store and dispose of according to local regulations.

7. Handling And Storage

Safe Storage:

>> Separated from strong oxidants and food and feedstuffs. Provision to contain effluent from fire extinguishing. Keep in a well-ventilated room. Store in an area without drain or sewer access.

Storage Conditions:

>> Keep container tightly closed in a dry and well-ventilated place. Storage class (TRGS 510): 13: Non Combustible Solids.

8. Exposure Control/ Personal Protection

>> Ca See Appendix A

>> 75.0 [ppm]

PEL-TWA (8-Hour Time Weighted Average)

>> 75 ppm (450 mg/m³)

>> 10.0 [ppm]

>> 10 ppm as TWA; A3 (confirmed animal carcinogen with unknown relevance to humans).

TLV-TWA (Time Weighted Average)

>> 10 ppm [1990]

EU-OEL

>> 12 mg/m

MAK (Maximale Arbeitsplatz Konzentration)

>> 12 mg/m

Inhalation Risk:

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

Effects of Short Term Exposure:

>> The substance is irritating to the eyes, respiratory tract and skin. The substance may cause effects on the blood. This may result in haemolytic anaemia. The substance may cause effects on the central nervous system.

Effects of Long Term Exposure:

>> The substance may have effects on the liver, central nervous system, blood and lungs. This may result in liver function impairment, neuropathy and anaemia. This substance is possibly carcinogenic to humans.

Fire Prevention

>> NO open flames. Above 66 °C use a closed system, ventilation and explosion-proof electrical equipment. Prevent deposition of dust.

Exposure Prevention

>> PREVENT DISPERSION OF DUST! STRICT HYGIENE!

Inhalation Prevention

>> Use ventilation, local exhaust or breathing protection.

Skin Prevention

>> Protective gloves.

Eye Prevention

>> Wear safety goggles or eye protection in combination with breathing protection.

Ingestion Prevention

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

Exposure Control and Personal Protection

Maximum Allowable Concentration (MAK)

>> 2.0 [ppm]

9. Physical And Chemical Properties

Molecular Weight:

>> 147.00

Exact Mass:

>> 145.9690055

Physical Description:

>> P-dichlorobenzene appears as a white colored liquid with the odor of moth balls. Denser than water and insoluble in water. Flash point below 200 °F. Used as a moth repellent, to make other chemicals, as a fumigant, and for many other uses.

>> COLOURLESS-TO-WHITE CRYSTALS WITH CHARACTERISTIC ODOUR.

Color/Form:

>> White crystals

Odor:

>> Distinctive aromatic odor ... becomes very strong at concentrations between 30 and 60 ppm

Boiling Point:

>> 345 °F at 760 mmHg (NTP, 1992)

>> 174 °C

Melting Point:

>> 127 °F (NTP, 1992)

>> 53 °C

Flash Point:

>> 150 °F (NTP, 1992)

>> 66 °C c.c.

Solubility:

>> less than 1 mg/mL at 73 °F (NTP, 1992)

>> Solubility in water, mg/l at 20 °C: 49 (practically insoluble)

Density:

>> 1.458 at 68 °F (USCG, 1999) - Denser than water; will sink

>> 1.2 g/cm³

Vapor Density:

>> 5.08 (NTP, 1992) - Heavier than air; will sink (Relative to Air)

>> Relative vapor density (air = 1): 5.08

Vapor Pressure:

>> 0.6 mmHg at 68 °F ; 1.8 mmHg at 86 °F (NTP, 1992)

>> Vapor pressure, Pa at 20 °C: 170

LogP:

>> log Kow = 3.44

>> 3.37

Stability/Shelf Life:

>> Stable under recommended storage conditions.

Autoignition Temperature:

>> No autoflammability up to 500 °C.

>> 640 °C

Decomposition:

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

Viscosity:

>> 0.839 mPa.s at 55 °C; 0.668 mPa.s at 79 °C

>> 0.73 mPa*s at 70 °C

Corrosivity:

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

>> Non-corrosive

Heat of Vaporization:

>> 49.0 kJ/mol at 25 °C

Surface Tension:

>> 31.4 dynes/cm

Ionization Potential:

>> 8.98 eV

Odor Threshold:

>> Odor Threshold Low: 0.12 [mmHg]

>> Odor Threshold High: 15.0 [mmHg]

>> Detection odor threshold from AIHA (mean = 0.12 ppm)

10. Stability And Reactivity

>> Insoluble in water.

11. Toxicological Information

Toxicity Summary:

>> IDENTIFICATION AND USE: 1,4-Dichlorobenzene (p-DCB) is a solid. It is used as moth repellent, general insecticide, germicide, space odorant, in manufacture of 2,5-dichloroaniline, dyes, intermediates, pharmacy, agriculture (fumigating soil). HUMAN STUDIES: Fumes from the surface of hot p-DCB may irritate skin slightly when contact is repeated or prolonged. Leukoencephalopathy has been described following ingestion of p-DCB mothballs. Hemolytic anemia and methemoglobinemia is more rarely reported in such cases. p-DCB increased the frequency of sister chromatid exchange in human peripheral blood lymphocytes in the absence of metabolic activation. ANIMAL STUDIES: p-DCB induces renal tumors specifically in male rats through an alpha2u-globulin-associated response. p-DCB failed to exhibit genotoxic effects in vivo, exhibiting negative responses in unscheduled DNA synthesis, in the chromosome aberration assay, in the dominant lethal assay, and in the in vivo micronucleus assay. It was reported as positive in one DNA strand breakage assay and in one in vivo micronucleus assay. p-DCB bound to DNA in the liver, lung, and kidney of mice but not in that of male rats. It also induced DNA damage in the liver and spleen but not in the kidney, lung, or bone marrow of mice. p-DCB was not mutagenic in Salmonella typhimurium strains TA 98, TA 100, TA 1535, or TA 1537 with or without metabolic activation. Acute and subchronic neurotoxicity studies have been performed with p-DCB. In rats, acute exposure to p-DCB at the rate of 50, 200 or 600 ppm caused decreased forelimb and hindlimb grip strengths and motor activity in males but not females at the high-dose. p-DCB was not teratogenic in rabbits. ECOTOXICITY STUDIES: Acute and chronic toxicity to freshwater aquatic life occur at concentrations as low as 1,120 and 763 ug/L. Acute toxicity to saltwater aquatic life occurs at concentrations as low as 1,970 ug/L. p-DCB was toxic to cell cultures of the tomato, soybean, and carrot. Concentrations of 0.5 mM caused 50% growth inhibition in carrot and soybean cultures. The tomato cultures were more sensitive, with 0.05 mM causing 50% growth inhibition.

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

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

Chemical

>> 1,4-Dichlorobenzene

USGS Parameter Code

>> 34571

MCL (Maximum Contaminant Levels)[µg/L]

>> 75

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 C Possible 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

>> para-Dichlorobenzene

IARC Carcinogenic Classes

>> Group 2B: Possibly carcinogenic to humans

IARC Monographs

>> 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 73: (1999) Some Chemicals that Cause Tumours of the Kidney or Urinary Bladder in Rodents and Some Other Substances

>> 2B, possibly carcinogenic to humans. (L135)

Health Effects:

>> Prolonged exposure to high concentration of 1,4-DCB may cause weakness, dizziness, loss of weight, liver injury. Chronic (months to years) ingestion of 1,4-DCB products can provoque skin blotches and problems with red blood cells, such as anemia. There is an indication that 1,4-DCB can affect the development of the nervous system after birth. 1,4-DCB is possibly a human carcinogen. (L395, T63)

Exposure Routes:

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

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

Inhalation Exposure

>> Cough. Sore throat. Drowsiness. Headache. Nausea. Shortness of breath. Vomiting.

Eye Exposure

>> Redness. Pain.

Ingestion Exposure

>> Diarrhoea. Further see Inhalation.

>> Eye irritation, swelling periorbital (situated around the eye); profuse rhinitis; headache, anorexia, nausea, vomiting; weight loss, jaundice, cirrhosis; In Animals: liver, kidney injury; [potential occupational carcinogen]

Target Organs:

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

>> Hepatic

>> Liver, respiratory system, eyes, kidneys, skin

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).

>> [in animals: liver & kidney cancer]

Adverse Effects:

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

>> 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.

>> Methemoglobinemia - The presence of increased methemoglobin in the blood; the compound is classified as secondary toxic effect

>> Hemolytic anemia - Decreased hemoglobin or number of red blood cells.

>> IARC Carcinogen - Class 3: Chemicals are not classifiable by the International Agency for Research on Cancer.

>> NTP Carcinogen - Reasonably anticipated to be a human carcinogen.

>> ACGIH Carcinogen - Confirmed Animal.

Toxicity Data:

>> LD50: >6000 mg/kg/day (Dermal, Rat) (L395) LD50: 500 mg/kg/day (Oral, Rat) (L395)

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

>> Acute Inhalation: 2 ppm (L395) Intermediate Inhalation: 0.2 ppm (L395) Chronic Inhalation: 0.01 ppm (L395) Intermediate Oral: 0.07 mg/kg/day (Rodent) (L395) Chronic Oral: 0.07 mg/kg/day (Rat) (L395)

Treatment:

Treatment when exposed to toxin

>> Administer charcoal as a slurry (240 mL water/30 g charcoal). Following inhalation, move patient to fresh air. Monitor for respiratory distress. If cough or difficulty breathing develops, evaluate for respiratory tract irritation, bronchitis, or pneumonitis. Administer oxygen and assist ventilation as required. Treat bronchospasm with inhaled beta2 agonist and oral or parenteral corticosteroids. 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:

>> In a model of liver carcinogenesis, groups of 12 (vehicle control) or 18 male Fischer 344 rats, 10 weeks of age, received a single intraperitoneal injection of either 200 mg/kg bw N-nitrosodiethylamine (NDEA) dissolved in 0.9% saline or saline alone. Two weeks after the NDEA or saline injection, para-dichlorobenzene (purity unspecified) was administered by gavage at doses of 0.1 or 0.4 mmol/kg bw/day in corn oil for 6 weeks; control groups received only corn oil or NDEA in corn oil. One week after the start of para-dichlorobenzene treatment (i.e. week 3), all animals underwent a partial hepatectomy. The study was terminated at the end of week 8. Hepatic foci were identified by immunohistochemical staining for the placental form of glutathione S-transferase. The incidence of hepatic foci was not increased, and the authors concluded that para-dichlorobenzene is not a liver tumor promoter.

Antidote and Emergency Treatment:

>> Immediate first aid: Ensure that adequate decontamination has been carried out. If patient is not breathing, start artificial respiration, preferably with a demand-valve resuscitator, bag-valve-mask device, or pocket mask, as trained. Perform CPR as 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. /Lindane and related compounds/

Human Toxicity Excerpts:

>> /SIGNS AND SYMPTOMS/ ... /58 men working with p-dichlorobenzene continuously or intermittently at concentrations/ from 50-170 ppm with average of 105 ppm ... /complained/ of eye and nose irritation ... ; /at/ 15-85 ppm with average of 45 ppm ... there were no complaints.

Non-Human Toxicity Excerpts:

>> /LABORATORY ANIMALS: Acute Exposure/ ... Rats /were fed p-dichlorobenzene/ as 20% solution in olive oil. ...They survived single doses of 1 g/kg bw, but ...succumbed to a dose of 4 g/kg bw. Guinea pigs were fed 50% solution and survived 1.6 g/kg bw as single dose and succumbed to a dose of 2.8 g/kg bw.

Non-Human Toxicity Values:

>> LD50 Rat (male, adult) oral 3863 mg/kg (95% confidence interal 3561-4153 mg/kg) /From table/

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.

>> ...The doses selected for the 2-year studies were 150 and 300 mg/kg for male rats and 300 and 600 mg/kg for female rats and male and female mice. In the 2-year studies, survival of female rats and of both sexes of mice was comparable to that of the vehicle controls; survival of high dose male rats was significantly lower than that of the vehicle controls (vehicle control, 32/50; low dose, 31/50; high dose, 20/50). Mean body weights of high dose male rats were 5%-8% lower than those of vehicle controls after week 38, and those of high dose female rats were 5%-7% lower than those of vehicle controls after week 55. Mean body weights of mice dosed with 1,4-dichlorobenzene were comparable to those of vehicle controls throughout the studies. Administration of 1,4-dichlorobenzene to male rats increased the average

severity of nephropathy and caused epithelial hyperplasia of the renal pelvis (1/50; 30/50; 31/50), mineralization of the collecting tubules in the renal medulla (4/50; 46/50; 47/50), and focal hyperplasia of renal tubular epithelium (0/50; 1/50; 9/50). There were increased incidences of nephropathy in both low and high dose female rats compared with vehicle controls (21/49; 32/50; 41/49). 1,4-Dichlorobenzene produced a dose-related increase in the incidence of tubular cell adenocarcinomas of the kidney in male rats (1/50; 3/50; 7/50); one tubular cell adenoma was observed in a high dose male rat. These malignant tumors are uncommon in male F344/N rats. They have been diagnosed in only 4/1,098 (0.4%) corn oil gavage controls in previous NTP studies. There were no tubular cell tumors in dosed or vehicle control female rats. There was a marginal increase in the incidence of mononuclear cell leukemia in dosed male rats compared with that in vehicle controls (5/50; 7/50; 11/50). 1,4-Dichlorobenzene increased the incidences of nonneoplastic liver lesions in male and female mice, including alteration in cell size (cytomegaly and karyomegaly), hepatocellular degeneration, and individual cell necrosis. 1,4-Dichlorobenzene also increased the incidences of nephropathy in male mice and renal tubular regeneration in female mice. 1,4-Dichlorobenzene increased the incidences of hepatocellular carcinomas in high dose male (14/50; 11/49; 32/50) and female (5/50; 5/48; 19/50) mice and hepatocellular adenomas in dosed male (5/50; 13/49; 16/50) and high dose female (10/50; 6/48; 21/50) mice. Hepatoblastomas were observed in four high dose male mice but not in vehicle controls. This rare tumor has not occurred in 1,091 male vehicle control mice in NTP studies. An increase in thyroid gland follicular cell hyperplasia was observed in dosed male mice (1/47; 4/48; 10/47), and there was a marginal positive trend in the incidence of follicular cell adenomas of the thyroid gland in female mice (0/48; 0/45; 3/46). Pheochromocytomas (benign or malignant, combined) of the adrenal gland occurred with a positive trend in dosed male mice, and the incidence in the high dose group was significantly greater than in vehicle controls (0/47; 2/48; 4/49). The incidence of adrenal gland medullary hyperplasia in male mice was 2/47; 4/48; and 4/49. Focal hyperplasia of the adrenal gland capsule was also observed in dosed male mice (11/47;21/48; 28/49). ...Under the conditions of these 2-year gavage studies, 1,4-dichlorobenzene produced clear evidence of carcinogenicity for male F344/N rats, as shown by an increased incidence of renal tubular cell adenocarcinomas. There was no evidence of carcinogenicity for female F344/N rats receiving doses of 300 or 600 mg/kg. There was clear evidence of carcinogenicity for both male and female B6C3F1 mice, as shown by increased incidences of hepatocellular carcinomas and hepatocellular adenomas. Marginal increases were observed in the incidences of pheochromocytomas of the adrenal gland in male mice. Nonneoplastic effects in the kidney of male and female rats, in the liver of male and female mice, and in the thyroid gland and adrenal gland of male mice were also associated with the administration of 1,4-dichlorobenzene.

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 mutagenic potential of para-dichlorobenzene was evaluated in the germ cells (Sex-Linked Recessive Lethal Mutation Assay) of Drosophila males exposed by inhalation. Based on preliminary toxicity determinations, groups of flies received nominal concentrations of 6,000, or 15,600 ppm/hr, resulting in a range of 3.4 - 23% mortality during exposure and pre-mating. None of the treatments produced mutant frequencies significantly greater than the negative control (air only).

Populations at Special Risk:

>> Persons with existing pathology (hepatic, renal, central nervous system, blood), or metabolic disorders, who are taking certain drugs (hormones, or otherwise metabolically active) or who are otherwise exposed to dichlorobenzenes or to related (chemically or biologically) chemicals, by such means as occupation or domestic use or abuse ... might well be considered at increased risk from exposure to dichlorobenzenes. /Dichlorobenzenes/

12. Ecological Information

Resident Soil (mg/kg)

>> 2.60e+00

Industrial Soil (mg/kg)

>> 1.10e+01

Resident Air (ug/m3)

>> 2.60e-01

Industrial Air (ug/m3)

>> 1.10e+00

Tapwater (ug/L)

>> 4.80e-01

MCL (ug/L)

>> 7.50e+01

Risk-based SSL (mg/kg)

>> 4.60e-04

MCL-based SSL (mg/kg)

>> 7.20e-02

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

>> 5.40e-03

Inhalation Unit Risk (ug/m3)-1

>> 1.1e-05

Chronic Oral Reference Dose (mg/kg-day)

>> 7.00e-02

Chronic Inhalation Reference Concentration (mg/m3)

>> 8.00e-01

Volatile

>> Volatile

Mutagen

>> Mutagen

Fraction of Contaminant Absorbed in Gastrointestinal Tract

>> 1

ICSC Environmental Data:

>> The substance is very toxic to aquatic organisms. Bioaccumulation of this chemical may occur in fish.

Sediment/Soil Concentrations:

Concentrations of this compound in sediment/soil.

>> SEDIMENT: 1,4-Dichlorobenzene was detected in the sediment of Lake Ketelmeer, Netherlands at concentrations of 550 and 210 ng/kg(1). Mean 1,4-dichlorobenzene concentrations of 5, 16, 9 and 94 ppb were detected in the superficial sediments from Lakes Superior, Huron, Erie, and Ontario, respectively(2). 1,4-Dichlorobenzene was detected at concentrations of less than 0.3 ng/g to 0.8 ng/g in the sediment of 7 rivers and ports in Niigata, Japan(3). 1,4-Dichlorobenzene was detected at concentrations of 110-150 ng/g in suspended sediment from Lake Ontario, at depths of 20-68 meters and an avg concentration of 63 ng/g for the bottom sediment(4). 1,4-Dichlorobenzene was identified, not quantified, in sediment from Dokai Bay, Japan(5). 1,4-Dichlorobenzene was detected at median concentrations of 91, 68, 50 and 39 ng/g in sediment taken from the Scheldt estuary, Netherlands(6). 1,4-Dichlorobenzene was detected in sediment at concentrations of 200-550 ug/kg in Lake Ketelmeer, Netherlands(7). 1,4-Dichlorobenzene was detected in sediment off the coast of Taiwan at concentrations of 3-12 ng/kg(8). 1,4-Dichlorobenzene was detected in 1.2% of sediment samples obtained from 20 major river basins in the US (sampled from 1992-1995) at a max concentration of 140 ug/kg(8). 1,4-Dichlorobenzene was detected in 86.2% of sediment samples at a range of not detected-278.4 ng/g dry wt from the Tonghui River of Beijing China. Mean concentrations of 51.4, 102.7 and 69.9 ng/g dry wt were reported for October 2003, January 2004 and April 2006, respectively; detection limit = 102.1 pg/g dry wt(9).

Fish/Seafood Concentrations:

Concentrations of this compound in fish or seafood.

>> 1,4-Dichlorobenzene was detected at concentrations of 1, 4 and 2-4 ppb in lake trout /Salvelinus namaycush/ taken from Lake Erie, Lake Huron and Lake Ontario, respectively, between April and November 1980(1). 1,4-Dichlorobenzene was identified, not quantified, in fish (carp, northern pike, blue gill, brown bullhead, redhorse sucker, walleye, rock bass, white sucker) caught in the Great Lakes between 1980 and 1981(2). Detectable levels of 1,4-dichlorobenzene /were found/ in fish of the Japanese coastal waters. A species of mackerel (Trachurus trachurus) contained 0.05 mg/kg (wet weight)(3).

Animal Concentrations:

Concentrations of this compound in animals.

>> Bovine tissue with an unusual smell was reported to contain 1,4-dichlorobenzene concentrations of 4.4-55.9 mg/kg in muscle, 165 mg/kg in perirenal fat, 11.3 mg/kg in pancreas, 1.9 mg/kg in lung, 3.4 mg/kg in liver and 2.8 mg/kg in spleen. Samples of adipose tissue from pigeons captured in central and suburban Tokyo contained mean concentrations of 1.35-2.43 mg/kg(1).

Average Daily Intake:

The average amount of the compound taken into the body through eating, drinking, or breathing.

>> The AVDI (via inhalation exposure only) of combined 1,2-, 1,3- and 1,4-dichlorobenzene isomers in the Netherlands is 7.0 ug/day(1). The AVDI of 1,4-dichlorobenzene in Japan was reported as 72.92 ug(2).

13. Disposal Considerations

Spillage Disposal

>> Personal protection: filter respirator for organic gases and particulates adapted to the airborne concentration of the substance. Do NOT let this chemical enter the environment. Sweep spilled substance into covered containers. If appropriate, moisten first to prevent dusting. Carefully collect remainder. 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 U072 and D027, must conform with USEPA regulations in storage, transportation, treatment and disposal of waste.

>> Product: Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber; Contaminated packaging: Dispose of as unused product.

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

>> p-Dichlorobenzene may be disposed of: 1) by making packages of p-dichlorobenzene in paper or other flammable material and burning in a suitable combustion chamber equipped with an appropriate effluent gas cleaning device. 2) By dissolving p-dichlorobenzene in a flammable solvent (such as alcohol) and atomizing in a suitable combustion chamber equipped with an appropriate effluent gas cleaning device. Recommendable method: Incineration.

>> For more Disposal Methods (Complete) data for 1,4-Dichlorobenzene (13 total), please visit the HSDB record page.

14. Transport Information

DOT

1,4-Dichlorobenzene
9
UN Pack Group: III
Reportable Quantity of 100 lb or 45

IATA

1,4-Dichlorobenzene
9,
UN Pack Group: III

15. Regulatory Information

Federal Drinking Water Standards:

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

>> Maximum contaminant levels (MCL) for organic contaminants apply to community and non-transient, non-community water systems: para-dichlorobenzene, MCL 0.075 mg/L.

Federal Drinking Water Guidelines:

Federal drinking water guidelines (e.g. maximum containment level (MCL)) for this chemical. In general, these guidelines are recommendations and not legally enforceable.

>> Maximum contaminant level goal (MCLG) for organic contaminants: para-dichlorobenzene, MCLG 0.075 mg/L.

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

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.

>> para-Dichlorobenzene is designated as a hazardous substance under section 311(b)(2)(A) of the Federal Water Pollution Control Act and further regulated by the Clean Water Act Amendments of 1977 and 1978. These regulations apply to discharges of this substance. This designation includes any isomers and hydrates, as well as any solutions and mixtures containing this substance.

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.

>> Section 8(a) of TSCA requires manufacturers of this chemical substance to report preliminary assessment information concerned with production, exposure, and use to EPA as cited in the preamble in 51 FR 41329. Effective date 8/4/95; Reporting date 10/3/95.

Regulatory Information

The Australian Inventory of Industrial Chemicals

>> Chemical: Benzene, 1,4-dichloro-

>> Specific Information Requirement: Obligations to provide information apply. You must tell us within 28 days if the circumstances of your importation or manufacture (introduction) are different to those in our assessment.

REACH Registered Substance

>> Status: Active Update: 15-09-2022 https://echa.europa.eu/registration-dossier/-/registered-dossier/14821

>> Status: Cease Manufacture Update: 15-04-2018 https://echa.europa.eu/registration-dossier/-/registered-dossier/24092

REACH Restricted Substance

>> Restricted substance: 1,4-Dichlorobenzene

>> EC: 203-400-5

New Zealand EPA Inventory of Chemical Status

>> 1,4-Dichlorobenzene: HSNO Approval: HSR002955 Approved with controls

16. Other Information

Toxic Combustion Products:

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

>> Special Hazards of Combustion Products: Vapors are irritating. Toxic chlorine, hydrogen chloride, and phosgene gases may be generated in fires.

Other Safety Information

Chemical Assessment

>> PEC / SN / Other assessments - para-Dichlorobenzene: Health and Environment

"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."