SAFETY DATA SHEET

Updated on 26/09/2024

1. Material Identification

Product Name : 2,4-DP
Catalog Number : io-2304
CAS Number : 120-36-5
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

>> H302 (98%): Harmful if swallowed [Warning Acute toxicity, oral]

>> H312 (98%): Harmful in contact with skin [Warning Acute toxicity, dermal]

>> H315 (100%): Causes skin irritation [Warning Skin corrosion/irritation]

>> H318 (98%): Causes serious eye damage [Danger Serious eye damage/eye irritation]

Precautionary Statement Codes

>> P264, P264+P265, P270, P280, P301+P317, P302+P352, P305+P354+P338, P317, P321, P330, P332+P317, P362+P364, and P501

Health Hazards:

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

>> Inhalation of material may be harmful. Contact may cause burns to skin and eyes. Inhalation of Asbestos dust may have a damaging effect on the lungs. Fire may produce irritating, corrosive and/or toxic gases. Some liquids produce vapors that may cause dizziness or asphyxiation. Runoff from fire control or dilution water may cause environmental contamination. (ERG, 2024)

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

>> Some may burn but none ignite readily. Containers may explode when heated. Some may be transported hot. For UN3508, Capacitor, asymmetric, be aware of possible short circuiting as this product is transported in a charged state. Polymeric beads, expandable (UN2211) may evolve flammable vapours. (ERG, 2024)

>> Combustible. Liquid formulations containing organic solvents may be flammable. Gives off irritating or toxic fumes (or gases) in a fire.

3. Composition/Information On Ingredients

Chemical name : 2,4-DP
CAS Number : 120-36-5
Molecular Formula : C9H8Cl2O3
Molecular Weight : 235.0600 g/mol

4. First Aid Measures

First Aid:

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

>> Refer to the "General First Aid" section. (ERG, 2024)

First Aid Measures

Inhalation First Aid

>> Fresh air, rest. Seek medical attention if you feel unwell.

Skin First Aid

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

Eye First Aid

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

Ingestion First Aid

>> Rinse mouth. Give one or two glasses of water to drink. Refer immediately 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)

>> In case of fire in the surroundings, use appropriate extinguishing media.

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: particulate filter respirator adapted to the airborne concentration of the substance. Do NOT let this chemical enter the environment. Sweep spilled substance into sealable 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:

>> Provision to contain effluent from fire extinguishing. Store in an area without drain or sewer access. Separated from food and feedstuffs.

Storage Conditions:

>> If stored below freezing, /it/ may be necessary to warm to 40 °F and agitate before using.

8. Exposure Control/ Personal Protection

Inhalation Risk:

>> A harmful concentration of airborne particles can be reached quickly when dispersed, especially if powdered.

Effects of Short Term Exposure:

>> The substance is corrosive to the eyes. The substance is irritating to the skin.

Effects of Long Term Exposure:

>> The substance may have effects on the kidneys. This may result in tissue lesions.

Fire Prevention

>> NO open flames. NO contact with hot surfaces.

Exposure Prevention

>> PREVENT DISPERSION OF DUST! AVOID EXPOSURE OF ADOLESCENTS AND CHILDREN!

Inhalation Prevention

>> Use local exhaust or breathing protection.

Skin Prevention

>> Protective gloves.

Eye Prevention

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

Ingestion Prevention

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

9. Physical And Chemical Properties

Molecular Weight:

>> 235.06

Exact Mass:

>> 233.9850495

Physical Description:

>> Yellowish to colorless solid. Soluble in organic solvents. Used as an herbicide.

>> ODOURLESS COLOURLESS-TO-YELLOWISH CRYSTALS.

Color/Form:

>> Colorless crystals

Odor:

>> ODORLESS

Melting Point:

>> 117.5 °C

>> 117-118 °C

Flash Point:

>> 204 °C o.c.

Solubility:

>> Solubility in water 900 g acid equivalent/L at 20 °C /Dichlorprop-potassium/

>> Solubility in water: none

Density:

>> 1.42

>> Relative density (water = 1): 1.4

Vapor Pressure:

>> 0.00000008 [mmHg]

>> negligible

LogP:

>> log Kow = 3.43

>> 3.43

Stability/Shelf Life:

>> STABLE TO HEAT, & RESISTANT TO REDUCTION, HYDROLYSIS & ATMOSPHERIC OXIDATION.

Decomposition:

>> When heated to decomposition it emits toxic chloride fumes.

Corrosivity:

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

>> CORROSIVE TO METALS IN PRESENCE OF WATER; CONCN SOLN (480 G AE/L) DOES NOT CORRODE IRON OR TIN PLATE OF IRON IF PH IS GREATER THAN OR EQUAL TO 8.6 & TEMP LESS THAN 70 °C.

Dissociation Constants:

>> pKa = 3.10

10. Stability And Reactivity

>> No rapid reaction with air. No rapid reaction with water.

11. Toxicological Information

Toxicity Summary:

>> CDDs cause their toxic effects by binding to the aryl hydrocarbon receptor and subsequently altering the trascription of certain genes. The affinity for the Ah receptor depends on the structure of the specific CDD. The change in gene expression may result from the direct interaction of the Ah receptor and its heterodimer-forming partner, the aryl hydrocarbon receptor nuclear translocator, with gene regulatory elements or the initiation of a phosphorylation/dephosphorylation cascade that subsequently activates other transcription factors. The affected genes include several oncogenes, growth factors, receptors, hormones, and drug-metabolizing enzymes. The change in transcription/translation of these genes is believed to be the cause of most of the toxic effects of CDDs. This includes 2,3,7,8-tetrachlorodibenzo-p-dioxin's carcinogenicity is thought to be the result of its ability to alter the capacity of both exogenous and endogenous substances to damage the DNA by inducing CYP1A1- and CYP1A2-dependent drug-metabolizing enzymes. (L177)

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

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

Chemical

>> Dichlorprop

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

>> 200

Benchmark Remarks

>> Data are for dichlorprop-p, CASRN 15165-67-0, which has an HHBP (2,4-DP-p). Toxicity of dichlorprop-p and the racemic dichlorprop are not significantly different.

Reference

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

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).

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

Health Effects:

>> It is considered to be a severe eye irritant. There has been concern that chlorophenoxy herbicides including dichlorprop may cause cancer, and in 1987 the International Agency for Research on Cancer (IARC) ranked this class of compounds as group 2B "possibly carcinogenic to humans". The EPA classifies the R-isomer as “Not Likely to be Carcinogenic to Humans.”(L369) Exposure to large amounts of CDDs causes chloracne, a severe skin disease with acne-like lesions that occur mainly on the face and upper body. CDDs may also cause liver damage and induce long-term alterations in glucose metabolism and subtle changes in hormonal levels. In addition, studies have shown that CDDs may disrupt the endocrine system and weaken the immune system, as well as cause reproductive damage and birth defects, central and peripheral nervous system pathology, thyroid disorders, endometriosis, and diabetes. 2,3,7,8-Tetrachlorodibenzo-p-dioxin is also a known human carcinogen. (L177, L178)

Exposure Routes:

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

Inhalation Exposure

>> Cough. Sore throat.

Skin Exposure

>> Redness.

Eye Exposure

>> Redness. Pain. Severe burns.

Ingestion Exposure

>> Sore throat. Headache. Nausea. Vomiting. Diarrhoea.

>> In addition to chloracne, CDD exposure causes skin rashes, discoloration, and excessive body hair. (L177)

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.

Toxicity Data:

>> LC (rat) > 1,600 mg/m3

Treatment:

Treatment when exposed to toxin

>> Treatment may include washing any areas of contact, GI decontamination if swallowed, administering an IV and forced alkaline diuresis. (L346)

Human Toxicity Excerpts:

>> /SIGNS AND SYMPTOMS/ Symptomatology (partly inferential): 1. Fatigue, weakness, anorexia; perhaps nausea, vomiting & diarrhea. 2. Hyporeflexia & lethargy progressing to coma, with constricted pupils (miosis). 3. Flaccid paralysis has been described in one comatose patients & grand mal convulsions with opisthotonos in another, hypertonia with areflexia in a third, & twitching & jerking in a fourth. ... 5. Progressive decline in blood pressure with death in deep coma. The possibility that hyperpyrexia & hypermetabolism may have contributed to the fatal outcome does not appear to have been ruled out (one comatose patient was described as sweating profusely). A terminal pneumonia is likely. 6. Disturbances in body temp regulation may be encountered. Perhaps severe reduction of body temp in cool or cold environments. More probably, febrile responses in warm environments or during exercise. 7. Progressive hypotension with death in peripheral vascular collapse, perhaps associated with acidosis due to lactic acidemia & other products of hypermetabolism. 8. In nonfatal poisonings, severe & protracted ... /SRP: neuropathy/ with pain, paresthesias & weakness. ... humans have experienced muscle fasciculations as well as myotonia. Chronic exposure may lead to central nervous system defects in the control of motor function. /2,4-D/

Non-Human Toxicity Excerpts:

>> /LABORATORY ANIMALS: Acute Exposure/ 2,4-DP technical /(PC 031401, a racemic mixture) was/ a severe to corrosive ocular irritant /in a ratbbit primary eye irritation study,/ a mild to moderate dermal irritant /in a rabbit primary skin irritation study, and a/ skin sensitizer /in a guinea pig dermal sensitization study/. /2,4-DP technical/ /From table/

Non-Human Toxicity Values:

>> LD50 Rat oral 800 mg/kg

12. Ecological Information

ICSC Environmental Data:

>> The substance is very toxic to aquatic organisms. The substance may cause long-term effects in the aquatic environment. This substance does enter the environment under normal use. Great care, however, should be taken to avoid any additional release, for example through inappropriate disposal.

Sediment/Soil Concentrations:

Concentrations of this compound in sediment/soil.

>> SEDIMENT: Dichlorprop was detected at 2 ug/kg in mobile sediment June to July 1990, and at 2 ug/kg June 18, 1991 in pond sediment at the south part of a pond, and at <2 ug/kg in the north part of the pond and at a stream 200 m south of a culvert outlet in southern Sweden(1).

13. Disposal Considerations

Spillage Disposal

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

Disposal Methods

>> SRP: The most favorable course of action is to use an alternative chemical product with less inherent propensity for occupational exposure or environmental contamination. 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 soil or water; effects on animal, aquatic, and plant life; and conformance with environmental and public health regulations.

14. Transport Information

DOT

2,4-DP
9
UN Pack Group: III

IATA

2,4-DP
9,
UN Pack Group: III

15. Regulatory Information

Regulatory Information

New Zealand EPA Inventory of Chemical Status

>> Dichlorprop: Does not have an individual approval but may be used under an appropriate group standard

16. Other Information

Other Safety Information

Chemical Assessment

>> IMAP assessments - Propanoic acid, 2-(2,4-dichlorophenoxy)-: Environment tier I assessment

>> IMAP assessments - Propanoic acid, 2-(2,4-dichlorophenoxy)-: Human health tier I 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."