SAFETY DATA SHEET

Updated on 26/09/2024

1. Material Identification

Product Name : p-Chloro-o-toluidine
Catalog Number : io-1992
CAS Number : 95-69-2
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

>> H301 (98.3%): Toxic if swallowed [Danger Acute toxicity, oral]

>> H311 (98.3%): Toxic in contact with skin [Danger Acute toxicity, dermal]

>> H331 (98.3%): Toxic if inhaled [Danger Acute toxicity, inhalation]

>> H341 (98.3%): Suspected of causing genetic defects [Warning Germ cell mutagenicity]

>> H350 (98.3%): May cause cancer [Danger Carcinogenicity]

>> H400 (98.3%): Very toxic to aquatic life [Warning Hazardous to the aquatic environment, acute hazard]

>> H410 (98.3%): Very toxic to aquatic life with long lasting effects [Warning Hazardous to the aquatic environment, long-term hazard]

Precautionary Statement Codes

>> P203, P261, P262, P264, P270, P271, P273, P280, P301+P316, P302+P352, P304+P340, P316, P318, P321, P330, P361+P364, P391, P403+P233, P405, and P501

Health Hazards:

>> Inhalation, ingestion, or skin contact causes bluish tint in fingernails, lips, and ears. Headache, drowsiness, and nausea also occur. Contact with eyes causes irritation. (USCG, 1999)

>> Special Hazards of Combustion Products: Toxic oxides of nitrogen and hydrochloric acid fumes may form. (USCG, 1999)

>> Combustible. Gives off irritating or toxic fumes (or gases) in a fire.

3. Composition/Information On Ingredients

Chemical name : p-Chloro-o-toluidine
CAS Number : 95-69-2
Molecular Formula : C7H8ClN
Molecular Weight : 141.6000 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. IMMEDIATELY call a hospital or poison control center even if no symptoms (such as redness or irritation) develop. IMMEDIATELY transport the victim to a hospital for treatment after washing the affected areas.

>> 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 immediately for medical attention.

Skin First Aid

>> Remove contaminated clothes. Rinse skin with plenty of water or shower. Refer immediately for medical attention.

Eye First Aid

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

>> Fire Extinguishing Agents: Water, dry chemical (USCG, 1999)

>> Use water spray, dry powder, carbon dioxide.

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 153 [Substances - Toxic and/or Corrosive (Combustible)]:

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

>> SPILL: Increase the immediate precautionary measure distance, in the downwind direction, as necessary.

>> FIRE: If tank, rail tank car or highway tank is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions. (ERG, 2024)

Spillage Disposal:

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

>> Sweep spilled substance into covered containers. Then store and dispose of according to local regulations. Do NOT let this chemical enter the environment.

7. Handling And Storage

Safe Storage:

>> Cool. Separated from food and feedstuffs. See Chemical Dangers. Well closed. Store in an area without drain or sewer access. Provision to contain effluent from fire extinguishing.

Storage Conditions:

>> PRECAUTIONS FOR "CARCINOGENS": Storage site should be as close as practical to lab in which carcinogens are to be used, so that only small quantities required for ... expt need to be carried. Carcinogens should be kept in only one section of cupboard, an explosion-proof refrigerator or freezer (depending on chemicophysical properties ...) that bears appropriate label. An inventory ... should be kept, showing quantity of carcinogen & date it was acquired ... Facilities for dispensing ... should be contiguous to storage area. /Chemical Carcinogens/

8. Exposure Control/ Personal Protection

MAK (Maximale Arbeitsplatz Konzentration)

>> skin absorption (H); carcinogen category: 1; germ cell mutagen group: 3A

Inhalation Risk:

>> A harmful contamination of the air will be reached rather slowly on evaporation of this substance at 20 °C; on spraying or dispersing, however, much faster.

Effects of Short Term Exposure:

>> May cause mechanical irritation to the skin, respiratory tract and eyes (as a solid). The substance may cause effects on the bladder. This may result in haemorrhagic inflammation. The substance may cause effects on the blood. This may result in the formation of methaemoglobin. The effects may be delayed. Medical observation is indicated.

Effects of Long Term Exposure:

>> May cause heritable genetic damage to human germ cells.

Fire Prevention

>> NO open flames.

Exposure Prevention

>> AVOID ALL CONTACT! IN ALL CASES CONSULT A DOCTOR!

Inhalation Prevention

>> Use breathing protection.

Skin Prevention

>> Protective gloves. Protective clothing.

Eye Prevention

>> Wear face shield 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:

>> 141.60

Exact Mass:

>> 141.0345270

Physical Description:

>> 4-chloro-o-toluidine is a gray to white solid with a weak fishy odor. Sinks in water. Freezing point is 77 °F. (USCG, 1999)

>> COLOURLESS TO BROWN SOLID IN VARIOUS FORMS OR LIQUID

Color/Form:

>> Crystalline, fused, grayish-white solid (commercial product)

Boiling Point:

>> 466 °F at 760 mmHg (NTP, 1992)

>> 241 °C

Melting Point:

>> 72 °F (NTP, 1992)

>> 29-30 °C

Flash Point:

>> 320 °F (NTP, 1992)

>> 99 °C c.c.

Solubility:

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

>> Solubility in water, g/100ml at 25 °C: 0.095 (very poor)

Density:

>> greater than 1.1 at 68 °F (est) (USCG, 1999)

>> 1.19 g/cm^3

Vapor Density:

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

Vapor Pressure:

>> 0.04 [mmHg]

>> Vapor pressure, Pa at 25 °C: 5.5

LogP:

>> 2.27

Autoignition Temperature:

>> 560 °C

Refractive Index:

>> INDEX OF REFRACTION: 1.5848 @ 20 °C/D ; MAX ABSORPTION (METHANOL): 296 NM (E= 180), 242 NM (E= 939)

Dissociation Constants:

>> pKa = 3.85 @ 25 °C

10. Stability And Reactivity

>> May be sensitive to prolonged exposure to air and light. Insoluble in water.

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

>> 4-Chloro-2-methylaniline

Reference Dose (RfD), Subchronic

>> 5 x 10^-1 mg/kg-day

PPRTV Assessment

>> PDF Document

Weight-Of-Evidence (WOE)

>> Likely to be carcinogenic to humans

Last Revision

>> 2010

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).

>> Evaluation: There is sufficient evidence for the carcinogenicity of para-chloro-ortho-toluidine hydrochloride in experimental animals. There is limited evidence for the carcinogenicity of para-chloro-ortho-toluidine in humans. In formulating the overall evaluation, the Working Group took note of the fact that any salt of para-chloro-orthotoluidine with a strong acid can be expected to behave chemically in a manner similar to the hydrochloride salt in solution and in vivo. Overall evaluation: para-Chloro-ortho-toluidine and its strong acid salts are probably carcinogenic to humans (Group 2A).

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

>> 4-Chloro-ortho-toluidine

IARC Carcinogenic Classes

>> Group 2A: Probably carcinogenic to humans

IARC Monographs

>> Volume 77: (2000) Some Industrial Chemicals

>> Volume 99: (2010) Some Aromatic Amines, Organic Dyes, and Related Exposures

Exposure Routes:

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

Inhalation Exposure

>> Cough. Red urine. Frequent, sudden and painful urination. Abdominal pain. Blue lips, fingernails and skin. Headache. Dizziness. Nausea. Drowsiness.

Skin Exposure

>> Redness. MAY BE ABSORBED! See Inhalation.

Eye Exposure

>> Redness. Pain.

Ingestion Exposure

>> See Inhalation.

Adverse Effects:

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

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

>> Reproductive Toxin - A chemical that is toxic to the reproductive system, including defects in the progeny and injury to male or female reproductive function. Reproductive toxicity includes developmental effects. See Guidelines for Reproductive Toxicity Risk Assessment.

>> IARC Carcinogen - Class 2: International Agency for Research on Cancer classifies chemicals as probable (2a), or possible (2b) human carcinogens.

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

Human Toxicity Excerpts:

>> ...HEMATURIA MAY BE OBSERVED IN MEN HANDLING...CHLORTOLUIDINES. ...MAY BE A HEMORRHAGIC CYSTITIS WITH PAINFUL & FREQUENT MICTURITION. THIS ACUTE PROBLEM IS OF NO LONG-TERM SIGNIFICANCE & CLEARS...ON CESSATION... IF HEMATURIA PERSISTS...OTHER PATHOLOGICAL URINARY TRACT PHENOMENA...CONSIDERED. /CHLOROTOLUIDINES/

Non-Human Toxicity Excerpts:

>> WHEN ADMIN TO MALE RATS AND MALE AND FEMALE HAM/ICR MICE IN DIET, 4-CHLORO-O-TOLUIDINE SHOWED CARCINOGENIC ACTIVITY IN MICE OF BOTH SEXES.

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 4-chloro-o-toluidine hydrochloride for possible carcinogenicity was conducted by admin the test chemical in feed to F344 rats and B6C3F1 mice Groups of 50 rats of each sex were admin 4-chloro-o-toluidine in the diet at one of two doses, either 1,250 or 5,000 ppm, for 107 wk. Groups of 50 mice of each sex were admin the test chemical in the diet at one of two doses, either 3,750 or 15,000 ppm for the males and either 1,250 or 5,000 ppm for females, for 99 wk, except for the high dose females (92 wk). Matched controls consisted of 20 untreated rats and 20 untreated mice of each sex. All surviving animals were killed at the end of admin of the test chemical. It is concluded that under the conditions of this bioassay, 4-chloro-o-toluidine hydrochloride was not carcinogenic for F344 rats but was carcinogenic for B6C3F1 mice, including hemangiosarcomas and hemangiomas in both males and females. ... Levels of Evidence of Carcinogenicity: Male Rats: Negative; Female Rats: Negative; Male Mice: Positive; Female Mice: Positive.

12. Ecological Information

Resident Soil (mg/kg)

>> 5.40e+00

Industrial Soil (mg/kg)

>> 2.30e+01

Resident Air (ug/m3)

>> 3.60e-02

Industrial Air (ug/m3)

>> 1.60e-01

Tapwater (ug/L)

>> 7.00e-01

MCL (ug/L)

>> 1.00e+03

Risk-based SSL (mg/kg)

>> 4.00e-04

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

>> 1.00e-01

Inhalation Unit Risk (ug/m3)-1

>> 7.7e-05

Chronic Oral Reference Dose (mg/kg-day)

>> 3.00e-03

Volatile

>> Volatile

Mutagen

>> Mutagen

Fraction of Contaminant Absorbed in Gastrointestinal Tract

>> 1

Fraction of Contaminant Absorbed Dermally from Soil

>> 0.1

ICSC Environmental Data:

>> The substance is harmful to aquatic organisms. It is strongly advised not to let the chemical enter into the environment.

Sediment/Soil Concentrations:

Concentrations of this compound in sediment/soil.

>> (14)C-LABELED 4-CHLORO-O-TOLUIDINE WAS ADDED TO NONAUTOCLAVED SOIL & INCUBATED FOR 6 WK. CARBON DIOXIDE COULD BE DETECTED IN AMT OF 20.0% OF ORIGINALLY APPLIED RADIOACTIVITY.

13. Disposal Considerations

Spillage Disposal

>> Sweep spilled substance into covered containers. Then store and dispose of according to local regulations. Do NOT let this chemical enter the environment.

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.

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

>> PRECAUTIONS FOR "CARCINOGENS": ... Incineration may be only feasible method for disposal of contaminated laboratory waste from biological expt. However, not all incinerators are suitable for this purpose. The most efficient type ... is probably the gas-fired type, in which a first-stage combustion with a less than stoichiometric air:fuel ratio is followed by a second stage with excess air. Some ... are designed to accept ... aqueous & organic-solvent solutions, otherwise it is necessary ... to absorb soln onto suitable combustible material, such as sawdust. Alternatively, chem destruction may be used, esp when small quantities ... are to be destroyed in laboratory. /Chemical Carcinogens/

>> PRECAUTIONS FOR "CARCINOGENS": HEPA (high-efficiency particulate arrestor) filters ... can be disposed of by incineration. For spent charcoal filters, the adsorbed material can be stripped off at high temp & carcinogenic wastes generated by this treatment conducted to & burned in an incinerator. ... LIQUID WASTE: ... Disposal should be carried out by incineration at temp that ... ensure complete combustion. SOLID WASTE: Carcasses of lab animals, cage litter & misc solid wastes ... should be disposed of by incineration at temp high enough to ensure destruction of chem carcinogens or their metabolites. /Chemical Carcinogens/

>> For more Disposal Methods (Complete) data for 4-CHLORO-O-TOLUIDINE (6 total), please visit the HSDB record page.

14. Transport Information

DOT

p-Chloro-o-toluidine
6.1
UN Pack Group: III

IATA

p-Chloro-o-toluidine
6.1,
UN Pack Group: III

15. Regulatory Information

Regulatory Information

The Australian Inventory of Industrial Chemicals

>> Chemical: Benzenamine, 4-chloro-2-methyl-

16. Other Information

Other Safety Information

Chemical Assessment

>> IMAP assessments - Benzenamine, 4-chloro-2-methyl- and its hydrochloride: Human health tier II assessment