SAFETY DATA SHEET

Updated on 26/09/2024

1. Material Identification

Product Name : p-Anisidine
Catalog Number : io-1737
CAS Number : 104-94-9
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)

Pictogram(s)

GHS Hazard Statements

>> H300+H310+H330 (49.2%): Fatal if swallowed, in contact with skin or if inhaled [Danger Acute toxicity, oral; acute toxicity, dermal; acute toxicity, inhalation]

>> H300 (100%): Fatal if swallowed [Danger Acute toxicity, oral]

>> H310 (82.6%): Fatal in contact with skin [Danger Acute toxicity, dermal]

>> H319 (29.1%): Causes serious eye irritation [Warning Serious eye damage/eye irritation]

>> H330 (82.6%): Fatal if inhaled [Danger Acute toxicity, inhalation]

>> H373 (99.7%): May causes damage to organs through prolonged or repeated exposure [Warning Specific target organ toxicity, repeated exposure]

>> H400 (100%): Very toxic to aquatic life [Warning Hazardous to the aquatic environment, acute hazard]

>> H412 (29.1%): Harmful to aquatic life with long lasting effects [Hazardous to the aquatic environment, long-term hazard]

Precautionary Statement Codes

>> P260, P262, P264, P264+P265, P270, P271, P273, P280, P284, P301+P316, P302+P352, P304+P340, P305+P351+P338, P316, P319, P320, P321, P330, P337+P317, P361+P364, P391, P403+P233, P405, and P501

NFPA 704 Diamond

NFPA Health Rating

>> 3 - Materials that, under emergency conditions, can cause serious or permanent injury.

NFPA Fire Rating

>> 1 - Materials that must be preheated before ignition can occur. Materials require considerable preheating, under all ambient temperature conditions, before ignition and combustion can occur.

NFPA Instability Rating

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

Health Hazards:

>> Excerpt from NIOSH Pocket Guide for p-Anisidine:

>> Exposure Routes: Inhalation, skin absorption, ingestion, skin and/or eye contact

>> Symptoms: Headache, dizziness; cyanosis; red blood cell Heinz bodies

>> Target Organs: Blood, kidneys, liver, cardiovascular system, central nervous system (NIOSH, 2024)

>> This chemical is flammable. (NTP, 1992)

>> Combustible. Gives off irritating or toxic fumes (or gases) in a fire. Finely dispersed particles form explosive mixtures in air.

3. Composition/Information On Ingredients

Chemical name : p-Anisidine
CAS Number : 104-94-9
Molecular Formula : C7H9NO
Molecular Weight : 123.1500 g/mol

4. First Aid Measures

First Aid:

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

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

>> INHALATION: IMMEDIATELY leave the contaminated area; take deep breaths of fresh air. If symptoms (such as wheezing, coughing, shortness of breath, or burning in the mouth, throat, or chest) develop, call a physician and be prepared to transport the victim to a hospital. Provide proper respiratory protection to rescuers entering an unknown atmosphere. Whenever possible, Self-Contained Breathing Apparatus (SCBA) should be used; if not available, use a level of protection greater than or equal to that advised under Protective Clothing.

>> INGESTION: DO NOT INDUCE VOMITING. 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. (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

>> Rinse with plenty of water (remove contact lenses if easily possible).

Ingestion First Aid

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

5. Fire Fighting Measures

>> Provision to contain effluent from fire extinguishing.

>> Fires involving this compound can be controlled with a dry chemical, carbon dioxide or Halon extinguisher. A water spray may also be used. (NTP, 1992)

>> Use water spray, foam, 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.

>> 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. Then store and dispose of according to local regulations.

7. Handling And Storage

Safe Storage:

>> Separated from strong oxidants, strong bases, acids, chloroformates and food and feedstuffs. Provision to contain effluent from fire extinguishing. Store in an area without drain or sewer access.

Storage Conditions:

>> Store in tightly closed containers in a cool, dark, well-ventilated area. Protect against sunlight and strong oxidizers. Metal containers involving the transfer of this chemical should be grounded and bonded. Where possible, automatically pump liquid from drums or other storage containers to process containers. Drums must be equipped with self-closing valves, pressure vacuum bungs, and flame arresters. Use only non-sparking tools and equipment, especially when opening and closing containers of this chemical. Sources of ignition, such as smoking and open flames, are prohibited where this chemical is used, handled, or stored in a manner that could create a potential fire or explosion hazard. A regulated, marked area should be established where this chemical is handled, used, or stored ... /Anisidines/

8. Exposure Control/ Personal Protection

>> TWA 0.5 mg/m3 [skin]

>> 0.5 [mg/m3]

>> 0.5 [mg/m3]

>> 0.5 mg/m

MAK (Maximale Arbeitsplatz Konzentration)

>> skin absorption (H); carcinogen category: 3

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:

>> The aerosol is irritating to the eyes and respiratory tract. The substance may cause effects on the blood. This may result in the formation of methaemoglobin. Medical observation is indicated.

Effects of Long Term Exposure:

>> The substance may have effects on the blood. This may result in the formation of methaemoglobin and anaemia.

Fire Prevention

>> NO open flames. Prevent deposition of dust. Closed system, dust explosion-proof electrical equipment and lighting.

Exposure Prevention

>> PREVENT DISPERSION OF DUST! STRICT HYGIENE! IN ALL CASES CONSULT A DOCTOR!

Inhalation Prevention

>> Use ventilation, local exhaust or breathing protection.

Skin Prevention

>> Protective gloves. Protective clothing.

Eye Prevention

>> Wear face shield or eye protection in combination with breathing protection.

Ingestion Prevention

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

Exposure Control and Personal Protection

Exposure Summary

>> Biological Exposure Indices (BEI) [ACGIH] - Methemoglobin in blood = 1.5% of hemoglobin during or at end of shift. [ACGIH]

9. Physical And Chemical Properties

Molecular Weight:

>> 123.15

Exact Mass:

>> 123.068413911

Physical Description:

>> P-anisidine appears as brown crystals or dark brown solid. Characteristic amine odor. (NTP, 1992)

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

Color/Form:

>> White solid

Odor:

>> Amine-like odor

Boiling Point:

>> 469 °F at 760 mmHg (NTP, 1992)

>> 243 °C

Melting Point:

>> 135 °F (NTP, 1992)

>> 57 °C

Flash Point:

>> 41 °F (NTP, 1992)

>> 122 °C

Solubility:

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

>> Solubility in water, g/100ml at 20 °C: 2.2 (moderate)

Density:

>> 1.071 at 135 °F (NTP, 1992) - Denser than water; will sink

>> 1.07 g/cm³

Vapor Density:

>> 4.25 (NTP, 1992) - Heavier than air; will sink (Relative to Air)

>> Relative vapor density (air = 1): 4.3

Vapor Pressure:

>> less than 0.1 mmHg at 68 °F (NTP, 1992)

>> Vapor pressure, Pa at 20 °C: 2

LogP:

>> log Kow = 0.95

>> 0.95

Autoignition Temperature:

>> 515 °C

>> 515 °C

Decomposition:

>> When heated to decomposition it emits toxic fumes of /nitrogen oxides./

Ionization Potential:

>> 7.44 eV

Ionization Efficiency:

The ratio of the number of ions formed to the number of electrons or photons used in an ionization process.

Ionization mode

>> Positive

logIE

>> 3.52

pH

>> 5.4

Instrument

>> Agilent 3Q

Ion source

>> JetStream

Additive

>> formic acid (5nM)

Organic modifier

>> MeOH (100%)

Reference

>> DOI:10.1002/slct.201702269

Refractive Index:

>> Index of refraction: 1.5559 at 60 °C/D

Dissociation Constants:

>> pKa = 5.36 at 25 °C

10. Stability And Reactivity

>> Insoluble in water.

11. Toxicological Information

Toxicity Summary:

>> p-Anisidine reacts with secondary oxidation products such as aldehydes and ketones in fats and oils. (Wikipedia)

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).

>> No data are available in humans. Inadequate evidence of carcinogenicity in animals. OVERALL EVALUATION: Group 3: The agent is not classifiable as to its carcinogenicity to humans.

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-Anisidine

IARC Carcinogenic Classes

>> Group 3: Not classifiable as to its carcinogenicity to humans

IARC Monographs

>> Volume 27: (1982) Some Aromatic Amines, Anthraquinones and Nitroso Compounds, and Inorganic Fluorides Used in Drinking-water and Dental Preparations

>> 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)

>> 3, not classifiable as to its carcinogenicity to humans. (L135)

Health Effects:

>> P-Anisidine is the most toxic of the three isomers of anisidine and causes blood damage upon oral ingestion, inhalation or skin contact. If heated strongly, it may release very toxic fumes of nitrogen oxides. (Wikipedia)

Exposure Routes:

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

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

Inhalation Exposure

>> Cough. Blue lips, fingernails and skin. Dizziness. Headache.

Skin Exposure

>> MAY BE ABSORBED! Further see Inhalation.

Eye Exposure

>> Redness.

Ingestion Exposure

>> Nausea. Further see Inhalation.

>> headache, dizziness; cyanosis; red blood cell Heinz bodies

Target Organs:

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

>> Blood, kidneys, liver, cardiovascular system, central nervous system

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

>> ACGIH Carcinogen - Not Classifiable.

Antidote and Emergency Treatment:

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

Human Toxicity Excerpts:

>> /SIGNS AND SYMPTOMS/ Short term exposure: ... can be absorbed through the skin, eyes, or mucous membranes, thereby increasing exposure. Contact with anisidines can irritate the eyes, skin, and respiratory tract, can cause a burning sensation and skin rash. Inhalation of p-anisidine can cause shortness of breath and coughing. Exposure can interfere with the blood's ability to carry hemoglobin (methemaglobinemia). This can cause headache, dizziness, cyanosis of the skin and lips. Higher levels can cause difficult breathing, collapse, and death. Long term exposure: Related aromatic amines are carcinogens, and p-anisidine may be carcinogenic as well. Repeated exposure to these isomers may cause anemia, skin allergy, lung irritation, and bronchitis; nerve and kidney damage. /Anisidines/

Non-Human Toxicity Excerpts:

>> /LABORATORY ANIMALS: Acute Exposure/ Nephrotoxicity of some aromatic nitro-amino compounds were evaluated by urinary enzyme activities and renal histopathological changes. Male Fischer 344 rats were intraperitoneally injected with aniline, p-aminophenol, acetyl-p-aminophenol, p-chloroaniline, p-chloronitrobenzene, p-anisidine, or p-nitroaniline at 1.0 mmol/kg. In the rats injected with p-aminophenol, necrosis of renal tubular epithelial cells and remarkable elevation of urinary N-acetyl-beta-D-glucosaminidase (NAG) and gamma-glutamyltranspeptidase (gamma-GTP) activities were observed. Injection with p-chloroaniline caused significant elevation of the urinary NAG and gamma-GTP activities. p-Anisidine and p-nitroaniline induced swelling of the tubular epithelial cells and a significant elevation in urinary NAG activities in rats, which was also caused by p-chloronitrobenzene. However, administration of aniline or acetyl-p-aminophenol did not change either the urinary enzymes or renal histopathology. These results indicate that p-aminophenol is a highly nephrotoxic substance, and that nephrotoxicity of p-chloroaniline, p-chloronitrobenzene, p-anisidine and p-nitroaniline exceed that of acetyl-p-aminophenol which has been known to cause renal damage.

Non-Human Toxicity Values:

>> LD50 Rat oral 1400 mg/kg

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 for possible carcinogenicity of p-anisidine hydrochloride was conducted using Fischer 344 rats and B6C3F1 mice. p-Anisidine hydrochloride was administered in the feed, at either of two concentrations, to groups of 55 male and 55 female animals of each species. Fifty-five animals of each sex and species were placed on test as controls. The high and low dietary concentrations of p-anisidine hydrochloride were, respectively, 0.6 and 0.3% for rats and 1.0 and 0.5% for mice. The cmpd was administered in the diet for 103 wk, followed by an observation period of 2 or 3 wk for rats and 2 wk for mice. ... There was insufficient evidence in the low dose bioassay and no evidence in the group receiving the high dose, to establish carcinogenicity of p-anisidine hydrochloride in Fischer 344 male rats. The cmpd was not carcinogenic in B6C3F1 mice. /p-Anisidine hydrochloride/

12. Ecological Information

ICSC Environmental Data:

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

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. 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 harm/injury/toxicity 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 and plant life; and conformance with environmental and public health regulations.

>> Dissolve in combustible solvent (alcohols, benzene, tec.) and spray solution into furnace equipped with afterburner and scrubber, or burn spill residue on sand and soda ash absorbent in a furnace. /Anisidines/

14. Transport Information

DOT

p-Anisidine
6.1
UN Pack Group: III

IATA

p-Anisidine
6.1,
UN Pack Group: III

15. Regulatory Information

Regulatory Information

The Australian Inventory of Industrial Chemicals

>> Chemical: Benzenamine, 4-methoxy-

REACH Registered Substance

>> Status: Active Update: 18-05-2018 https://echa.europa.eu/registration-dossier/-/registered-dossier/17660

>> Status: Active Update: 03-07-2017 https://echa.europa.eu/registration-dossier/-/registered-dossier/19981

New Zealand EPA Inventory of Chemical Status

>> 4-Anisidine: Does not have an individual approval but may be used under an appropriate group standard

16. Other Information

Toxic Combustion Products:

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

>> Poisonous gases including nitrogen oxides are produced in fire. /Anisidines/

Other Safety Information

Chemical Assessment

>> IMAP assessments - p-Anisidine and its hydrochloride: Human health tier II assessment

"The information provided is believed to be accurate but is not comprehensive and should be used as a reference. It reflects our current knowledge and is intended for safety guidance related to the product. This document does not constitute a warranty of the product's properties. Ionz is not responsible for any damages resulting from handling or contact with the product incorrectly."