ionz

SAFETY DATA SHEET

Updated on 26/09/2024

1. Material Identification

Product Name : O-Anisidine
Catalog Number : io-1736
CAS Number : 90-04-0
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+H311+H331 (43.4%): Toxic if swallowed, in contact with skin or if inhaled [Danger Acute toxicity, oral; acute toxicity, dermal; acute toxicity, inhalation]

>> H301 (100%): Toxic if swallowed [Danger Acute toxicity, oral]

>> H311 (100%): Toxic in contact with skin [Danger Acute toxicity, dermal]

>> H331 (100%): Toxic if inhaled [Danger Acute toxicity, inhalation]

>> H341 (99.6%): Suspected of causing genetic defects [Warning Germ cell mutagenicity]

>> H350 (99.6%): May cause cancer [Danger Carcinogenicity]

>> H373 (36%): May causes damage to organs through prolonged or repeated exposure [Warning Specific target organ toxicity, repeated exposure]

>> H411 (32.4%): Toxic to aquatic life with long lasting effects [Hazardous to the aquatic environment, long-term hazard]

Precautionary Statement Codes

>> P203, P260, P261, P262, P264, P270, P271, P273, P280, P301+P316, P302+P352, P304+P340, P316, P318, P319, P321, P330, P361+P364, P391, P403+P233, 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

>> 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 o-Anisidine:

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

>> Symptoms: Headache, dizziness; cyanosis; red blood cell Heinz bodies; [potential occupational carcinogen]

>> Target Organs: Blood, kidneys, liver, cardiovascular system, central nervous system

>> Cancer Site: [in animals: tumors of the thyroid gland, bladder & kidneys] (NIOSH, 2024)

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

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

3. Composition/Information On Ingredients

Chemical name : O-Anisidine
CAS Number : 90-04-0
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. 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. Administration of oxygen may be needed. Refer immediately for medical attention.

Skin First Aid

>> Administration of oxygen may be needed. Remove contaminated clothes. Rinse and then wash skin with water and soap. Refer immediately for medical attention.

Eye First Aid

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

Ingestion First Aid

>> Administration of oxygen may be needed. Rinse mouth. Do NOT induce vomiting. Give one or two glasses of water to drink. Refer immediately for medical attention.

5. Fire Fighting Measures

>> Fires involving this material 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.

>> Evacuate danger area! Consult an expert! Personal protection: chemical protection suit including self-contained breathing apparatus. Do NOT let this chemical enter the environment. Do NOT wash away into sewer. Collect leaking liquid in sealable containers. Absorb liquid in sand or inert absorbent. Then store and dispose of according to local regulations.

7. Handling And Storage

Safe Storage:

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

Storage Conditions:

>> Store in tightly closed containers in a cool, 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 nonsparking 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

>> Ca TWA 0.5 mg/m3 [skin] See Appendix A

>> 0.5 [mg/m3]

>> 0.5 [mg/m3]

>> 0.5 mg/m

MAK (Maximale Arbeitsplatz Konzentration)

>> skin absorption (H); carcinogen category: 2

Inhalation Risk:

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

Effects of Short Term Exposure:

>> The substance may cause effects on the blood. This may result in the formation of methaemoglobin. Exposure could cause haemolysis. This may result in haemolytic anaemia. The effects may be delayed. 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. This substance is possibly carcinogenic to humans.

Fire Prevention

>> NO open flames.

Exposure Prevention

>> PREVENT GENERATION OF MISTS! AVOID ALL CONTACT! 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.

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:

>> O-anisidine appears as clear, yellowish to reddish or brown liquid with an amine (fishy) odor. (NTP, 1992)

>> RED-TO-YELLOW OILY LIQUID WITH CHARACTERISTIC ODOUR. TURNS BROWN ON EXPOSURE TO AIR.

Color/Form:

>> Yellowish liquid; becomes brownish on exposure to air

Odor:

>> Amine-like odor

Boiling Point:

>> 437 °F at 760 mmHg (NTP, 1992)

>> 224-225 °C

Melting Point:

>> 41 °F (NTP, 1992)

>> 5 °C

Flash Point:

>> 210 °F (NTP, 1992)

>> 107 °C c.c.

Solubility:

>> less than 0.1 mg/mL at 66 °F (NTP, 1992)

>> Solubility in water, g/100ml at 20 °C: 1.5 (moderate)

Density:

>> 1.0923 at 68 °F (NTP, 1992) - Denser than water; will sink

>> Density (at 20 °C): 1.09 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 ; 1 mmHg at 141.8 °F (NTP, 1992)

>> Vapor pressure, kPa at 20 °C: 5

LogP:

>> log Kow = 1.18

>> 1.18

Stability/Shelf Life:

>> Heat may contribute to instability.

Autoignition Temperature:

>> 415 °C

>> 430 °C

Decomposition:

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

Viscosity:

>> Dynamic viscosity: 2.211 mPa-s at 55 °C

>> 2.028 mm²/s at 55 °C

Ionization Potential:

>> 7.44 eV

Refractive Index:

>> Index of refraction: 1.5715 at 10 °C/D

Dissociation Constants:

>> pKa = 4.53 (conjugate acid)

10. Stability And Reactivity

>> This chemical darkens on exposure to air. Insoluble in water.

11. Toxicological Information

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 inadequate evidence in humans for the carcinogenicity of ortho-anisidine. There is sufficient evidence in experimental animals for the carcinogenicity of ortho-anisidine. Overall evaluation: ortho-Anisidine is possibly carcinogenic to humans (Group 2B).

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

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

Skin Exposure

>> MAY BE ABSORBED! Further see Inhalation.

Eye Exposure

>> Redness. Pain.

Ingestion Exposure

>> Nausea. Further see Inhalation.

>> headache, dizziness; cyanosis; red blood cell Heinz bodies; [potential occupational carcinogen]

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

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: tumors of the thyroid gland, bladder & kidneys]

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.

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

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

>> ACGIH Carcinogen - Confirmed Animal.

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. Exposure can interfere with the blood's ability to carry hemoglobin (methemoglobinemia). This can cause headache, dizziness, cyanosis of the skin and lips. Higher levels can cause difficult breathing, collapse, and death. Long term exposure: o-Anisidine is a probably carcinogen in humans (IARC: Group 2B, limited human evidence). Related aromatic amines are carcinogens ... 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/ In an oral study according to OECD Guideline 401 (application of 1,250 - 1,600 - 1,800 - 2,000 - 2,500 - 3,150 or 4,000 mg/kg bw via gavage), the LD50 for Wistar rats was 1,890 mg/kg bw. Squatting, staggering gait, reduced spontaneous activity, dizziness and respiratory depression was noted in the lower dose-groups. In addition, in the higher dose-groups, abdominal position, negative righting reflex, orange urine, pale skin and at doses of more than 2,500 mg/kg bw, in some cases respiratory sounds were reported. Gross necropsy revealed congestion of blood vessels in the gastrointestinal tract and lungs, a yellow-red foamy liquid in the intestine, and hemorrhages in stomach, intestine, and urinary bladder. With the exception of one animal dosed with 1,800 mg/kg bw (recovery within 11 days), in all other surviving animals no signs of toxicity were seen 4 days after application. In other studies, which cannot be validated due to insufficient documentation, LD50 values of 2,020 mg/kg bw for rats and 1,410 mg/kg bw for mice and 870 mg/kg bw for rabbits have been reported. Some hematological changes, anemia and nephrotoxicity have been described.

Non-Human Toxicity Values:

>> LD50 Rat (Wistar) oral 1,890 mg/kg bw

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 o-anisidine hydrochloride for possible carcinogenicity was conducted by administering the test chemical in feed to Fischer 344 rats and B6C3F1 mice. Groups of 55 rats of each sex and 55 mice of each sex were administered o-anisidine hydrochloride at one of the following doses, either 5,000 or 10,000 ppm for rats and either 2,500 or 5,000 ppm for mice, for 103 wk, then observed for 1 or 2 additional wk. Controls consisted of groups of 55 untreated rats of each sex and 55 untreated mice of each sex. All surviving rats were /sacrificed/ at 103-107 wk, and all surviving mice at 104 or 105 wk. It was concluded that under the conditions of this bioassay, o-anisidine hydrochloride was carcinogenic for Fischer 344 rats and B6C3F1 mice, inducing transitional cell carcinomas or papillomas of the bladder in both rats and mice and in both sexes of each species, transitional cell carcinomas of the pelvis of the kidney in male rats, and follicular cell tumors of the thyroid in male rats. Levels of Evidence of Carcinogenicity: Male Rats: Positive; Female Rats: Positive; Male Mice: Positive; Female Mice: Positive. /o-Anisidine hydrochloride/

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.

>> o-Anisidine (CAS # 90-04-0) was evaluated for subacute oral toxicity in male rats (5/dose group, breed unspecified) fed 1-12 gavage doses of 0, 10, 100, 500, or 1000 mg/kg over 1-16 days. A first dose of 1000 mg/kg (1 dose) resulted in unanimous prostration, with rapid breathing and heart rate within 1 hour. At 24 hours, 1 rat had recovered, 2 were moribund with persisting acute symptoms, and 3 rats had died. Urine was brown with no evidence of blood on dipstick. All surviving high-dose rats were necropsied with the lethalities 24 hours after a single dose. In the remaining groups clinical signs included prostration (500 mg/kg), rapid and shallow respiration (500 mg/kg), accelerated heart rate (500 mg/kg), mortality (1/5, 500 mg/kg), dark urine (500, 100 mg/kg), slight anorexic weight loss (500 mg/kg), and depression (100 mg/kg). Clinical chemistries revealed slight elevation of GPT only in the 500 mg/kg group. This group also demonstrated moderate elevation of white blood cell count, anomalies of red cell indices and cellular morphology. Increased corpuscular volume and mean hemoglobin with normal hemoglobin concentration indicated normochromic macrocytosis; the blood smear showed polychromasia, anisocytosis, macrocytosis, and Howell-Jolly bodies. Upon necropsy, relative liver weights were increased slightly in 500 mg/kg rats, while absolute and relative spleen weight elevations were marked in 100 mg/kg rats and moderate in 50 and 10 mg/kg rats. Necropsy also revealed urethral obstruction (1/5, 1000 mg/kg), pale and swollen kidneys (2/5 1000 mg/kg), blood in small intestine with brown urine-filled distended urinary bladders (4/5, 1000 mg/kg; 1/5, 500 mg/kg), enlarged spleen (5/5, 500 mg/kg), and darkened spleen (4/5, 500 mg/kg). A repeat-dose oral LOAEL was 10 mg/kg. Histologic changes in the 500 mg/kg group included

splenic congestion (1/5), hypertrophy of hepatic nuclei (1/5), and mild granular hepatic cytoplasm (3/5). The authors concluded that erythrocytes, spleen, and possibly liver appear to be targets of o-anisidine toxicity. In addition, portal of entry effects were observed from local high dose in the gastrointestinal tract.

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

>> Evacuate danger area! Consult an expert! Personal protection: chemical protection suit including self-contained breathing apparatus. Do NOT let this chemical enter the environment. Do NOT wash away into sewer. Collect leaking liquid in sealable containers. Absorb liquid in sand or inert absorbent. 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, etc.) and spray solution into furnace equipped with afterburner and scrubber or burn spill residue on sand and soda ash absorbent in a furnace. /Anisidines/

>> 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/

>> For more Disposal Methods (Complete) data for o-Anisidine (7 total), please visit the HSDB record page.

14. Transport Information

DOT

O-Anisidine
6.1
UN Pack Group: III
Reportable Quantity of 100 lb or 45

IATA

O-Anisidine
6.1,
UN Pack Group: III

15. Regulatory Information

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 3/11/94; Reporting date: 5/10/94.

Regulatory Information

The Australian Inventory of Industrial Chemicals

>> Chemical: Benzenamine, 2-methoxy-

REACH Registered Substance

>> Status: Active Update: 21-06-2012 https://echa.europa.eu/registration-dossier/-/registered-dossier/1695

>> Status: Active Update: 06-09-2021 https://echa.europa.eu/registration-dossier/-/registered-dossier/13498

>> Status: Active Update: 10-10-2012 https://echa.europa.eu/registration-dossier/-/registered-dossier/6201

REACH Substances of Very High Concern (SVHC)

>> Substance: 2-Methoxyaniline, o-Anisidine

>> EC: 201-963-1

>> Date of inclusion: >19-Dec-2011

>> Reason for inclusion: Carcinogenic (Article 57a)

New Zealand EPA Inventory of Chemical Status

>> 2-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 - Benzenamine, 2-methoxy-: Environment tier I assessment

>> IMAP assessments - Benzenamine, 2-methoxy-: 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."