SAFETY DATA SHEET

Updated on 26/09/2024

1. Material Identification

Product Name : Benzidine
Catalog Number : io-1800
CAS Number : 92-87-5
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 (100%): Harmful if swallowed [Warning Acute toxicity, oral]

>> H350 (100%): May cause cancer [Danger Carcinogenicity]

>> H400 (98.8%): 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, P270, P273, P280, P301+P317, P318, P330, P391, P405, and P501

Health Hazards:

>> Poisonous if inhaled, swallowed or absorbed through skin. May cause contact dermatitis, irritation or sensitization. Ingestion may cause nausea and vomiting. (USCG, 1999)

ERG 2024, Guide 153 (Benzidine)

>> TOXIC and/or CORROSIVE; inhalation, ingestion or skin contact with material may cause severe injury or death.

>> Methyl bromoacetate (UN2643) is an eye irritant/lachrymator (causes flow of tears).

>> Contact with molten substance may cause severe burns to skin and eyes.

>> Avoid any skin contact.

>> Fire may produce irritating, corrosive and/or toxic gases.

>> Runoff from fire control or dilution water may be corrosive and/or toxic and cause environmental contamination.

>> Special Hazards of Combustion Products: Contain highly toxic NOx fumes.

>> Behavior in Fire: Produces highly toxic fumes. (USCG, 1999)

ERG 2024, Guide 153 (Benzidine)

>> Combustible material: may burn but does not ignite readily.

>> When heated, vapors may form explosive mixtures with air: indoors, outdoors and sewers explosion hazards.

>> Those substances designated with a (P) may polymerize explosively when heated or involved in a fire.

>> Corrosives in contact with metals may evolve flammable hydrogen gas.

>> Containers may explode when heated.

>> Runoff may pollute waterways.

>> Substance may be transported in a molten form.

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

3. Composition/Information On Ingredients

Chemical name : Benzidine
CAS Number : 92-87-5
Molecular Formula : C12H12N2
Molecular Weight : 184.2400 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)

ERG 2024, Guide 153 (Benzidine)

>> General First Aid:

>> Call 911 or emergency medical service.

>> Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves and avoid contamination.

>> Move victim to fresh air if it can be done safely.

>> Administer oxygen if breathing is difficult.

>> If victim is not breathing:

>> DO NOT perform mouth-to-mouth resuscitation; the victim may have ingestedor inhaled the substance.

>> If equipped and pulse detected, wash face and mouth, then give artificial respiration using a proper respiratory medical device (bag-valve mask, pocket mask equipped with a one-way valve or other device).

>> If no pulse detected or no respiratory medical device available, provide continuouscompressions. Conduct a pulse check every two minutes or monitor for any signs of spontaneous respirations.

>> Remove and isolate contaminated clothing and shoes.

>> For minor skin contact, avoid spreading material on unaffected skin.

>> In case of contact with substance, remove immediately by flushing skin or eyes with running water for at least 20 minutes.

>> For severe burns, immediate medical attention is required.

>> Effects of exposure (inhalation, ingestion, or skin contact) to substance may be delayed.

>> Keep victim calm and warm.

>> Keep victim under observation.

>> For further assistance, contact your local Poison Control Center.

>> Note: Basic Life Support (BLS) and Advanced Life Support (ALS) should be done by trained professionals.

>> Specific First Aid:

>> For corrosives, in case of contact, immediately flush skin or eyes with running water for at least 30 minutes. Additional flushing may be required.

>> Removal of solidified molten material from skin requires medical assistance.

>> In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping paper and/or the "ERAP" section.

First Aid Measures

Inhalation First Aid

>> Fresh air, rest.

Skin First Aid

>> Remove contaminated clothes. Rinse and then wash skin with water and soap. Wear protective gloves when administering first aid.

Eye First Aid

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

Ingestion First Aid

>> Rinse mouth.

5. Fire Fighting Measures

>> Excerpt from ERG Guide 153 [Substances - Toxic and/or Corrosive (Combustible)]:

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

>> LARGE FIRE: Dry chemical, CO2, alcohol-resistant foam or water spray. 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, RAIL TANK CARS OR HIGHWAY TANKS: Fight fire from maximum distance or use unmanned master stream devices or monitor nozzles. Do not get water inside containers. 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, 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)

Evacuation: ERG 2024, Guide 153 (Benzidine)

>> 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

>> For non-highlighted materials: 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.

Spillage Disposal:

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

>> Personal protection: chemical protection suit including self-contained breathing apparatus. 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.

Accidental Release Measures

Public Safety: ERG 2024, Guide 153 (Benzidine)

>> CALL 911. Then call emergency response telephone number on shipping paper. If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.

>> Keep unauthorized personnel away.

>> Stay upwind, uphill and/or upstream.

>> Ventilate closed spaces before entering, but only if properly trained and equipped.

Spill or Leak: ERG 2024, Guide 153 (Benzidine)

>> ELIMINATE all ignition sources (no smoking, flares, sparks or flames) from immediate area.

>> Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.

>> Stop leak if you can do it without risk.

>> Prevent entry into waterways, sewers, basements or confined areas.

>> Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers.

>> DO NOT GET WATER INSIDE CONTAINERS.

7. Handling And Storage

Safe Storage:

>> Provision to contain effluent from fire extinguishing. Separated from strong oxidants and food and feedstuffs. Keep in the dark. Well closed. Store in an area without drain or sewer access.

Storage Conditions:

>> KEEP WELL CLOSED & PROTECTED FROM LIGHT.

8. Exposure Control/ Personal Protection

>> Ca See Appendix ASee Appendix C

>> [1910.1010] See Appendix BSee Appendix C

>> Exposure by all routes should be carefully controlled to levels as low as possible; skin

>> A1 (confirmed human carcinogen); (skin).

MAK (Maximale Arbeitsplatz Konzentration)

>> carcinogen category: 1.

Emergency Response: ERG 2024, Guide 153 (Benzidine)

>> Small Fire

>> Dry chemical, CO2 or water spray.

>> Large Fire

>> Dry chemical, CO2, alcohol-resistant foam or water spray.

>> 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, Rail Tank Cars or Highway Tanks

>> Fight fire from maximum distance or use unmanned master stream devices or monitor nozzles.

>> Do not get water inside containers.

>> 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.

Inhalation Risk:

>> Evaporation at 20 °C is negligible; a harmful concentration of airborne particles can, however, be reached quickly when dispersed, especially if powdered.

Effects of Long Term Exposure:

>> This substance is carcinogenic to humans.

Fire Prevention

>> NO open flames.

Exposure Prevention

>> See EFFECTS OF LONG-TERM OR REPEATED EXPOSURE. AVOID ALL CONTACT!

Inhalation Prevention

>> Use closed system and ventilation.

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.

Exposure Control and Personal Protection

Protective Clothing: ERG 2024, Guide 153 (Benzidine)

>> Wear positive pressure self-contained breathing apparatus (SCBA).

>> Wear chemical protective clothing that is specifically recommended by the manufacturer when there is NO RISK OF FIRE.

>> Structural firefighters' protective clothing provides thermal protection but only limited chemical protection.

9. Physical And Chemical Properties

Molecular Weight:

>> 184.24

Exact Mass:

>> 184.100048391

Physical Description:

>> Benzidine appears as a grayish-yellow to grayish-red, crystalline solid. Toxic by ingestion, inhalation, and skin absorption. Combustion produces toxic oxides of nitrogen. Used to make other chemicals and in chemical and biological analysis.

>> COLOURLESS OR REDDISH CRYSTALLINE POWDER. TURNS DARK ON EXPOSURE TO AIR AND LIGHT.

Color/Form:

>> White or slightly-reddish, crystalline powder

Boiling Point:

>> 752 °F at 740 mmHg (NTP, 1992)

>> 401 °C

Melting Point:

>> 262 °F (NTP, 1992)

>> 120 °C

Solubility:

>> less than 1 mg/mL at 72 °F (NTP, 1992)

>> Solubility in water, g/100ml at 25 °C:

Density:

>> 2.15 at 68 °F (USCG, 1999) - Denser than water; will sink

>> 1.3 g/cm³

Vapor Density:

>> 6.36 (NTP, 1992) - Heavier than air; will sink (Relative to Air)

>> Relative vapor density (air = 1): 6.4

Vapor Pressure:

>> Low (NIOSH, 2024)

LogP:

>> log Kow= 1.34

>> 1.34

Stability/Shelf Life:

>> DARKENS ON EXPOSURE TO AIR & LIGHT

Decomposition:

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

Dissociation Constants:

>> pKa1= 4.3 pKa2= 3.3

10. Stability And Reactivity

>> Darkens on exposure to air and light. Soluble in hot water.

11. Toxicological Information

Toxicity Summary:

>> N-acetylated benzidine metabolites are believed to form adducts with nucleic acids. Carcinogenesis is initiated when they are activated by peroxidation by prostaglandin H synthetase, oxidation by cytochrome P-450, or O-esterification by O-acetyltransferase or N,O-acetyltransferase. Benzidine has also been shown to bind to RNA and hemoglobin. (L95, A55)

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

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

Chemical

>> Benzidine

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

>> 20

Cancer HBSL [µg/L]

>> 0.0001-0.01

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).

>> CLASSIFICATION: A; human carcinogen. BASIS FOR CLASSIFICATION: Observation of increased incidence of bladder cancer and bladder cancer-related deaths in exposed workers. HUMAN CARCINOGENICITY DATA: Sufficient.

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

>> Benzidine

IARC Carcinogenic Classes

>> Group 1: Carcinogenic to humans

IARC Monographs

>> Volume 29: (1982) Some Industrial Chemicals and Dyestuffs

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

>> Volume 100F: (2012) Chemical Agents and Related Occupations

>> 1, carcinogenic to humans. (L135)

Health Effects:

>> Benzidine is a known human carcinogen, most often associated with cancer of the urinary bladder. If benzidine comes in contact with skin it may cause a skin allergy. Liver, kidney, immune, and neurological effects have also been observed in animals exposed to benzidine. (L95)

Exposure Routes:

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

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

Skin Exposure

>> MAY BE ABSORBED!

>> hematuria (blood in the urine); secondary anemia from hemolysis; acute cystitis; acute liver disorders; dermatitis; painful, irreg urination; [potential occupational carcinogen]

Target Organs:

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

>> Cancer, Gastrointestinal (Stomach and Intestines, part of the digestive system), Hepatic (Liver), Renal (Urinary System or Kidneys)

>> Hepatic

>> Nervous

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).

>> Urinary

>> [liver, kidney & bladder 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.

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

>> IARC Carcinogen - Class 1: International Agency for Research on Cancer classifies chemicals as established human carcinogens.

>> NTP Carcinogen - Known to be a human carcinogen.

>> ACGIH Carcinogen - Confirmed Human.

Toxicity Data:

>> LD50: 309 mg/kg (Oral, Rat) (T14) LD50: 110 mg/kg (Intraperitoneal, Mouse) (T14)

Interactions:

>> Continuous administration of neozone D to dogs and rats failed to reveal its carcinogenicity. Nor did the agent potentiate the carcinogenic effect of benzidine in rats. Conversely, neozone D was found to inhibit benzidine induced carcinogenesis in female rats.

Antidote and Emergency Treatment:

>> Basic treatment: Establish a patent airway. Suction if necessary. Watch for signs of respiratory insufficiency and assist ventilations if necessary. Administer oxygen by nonrebreather mask at 10 to 15 L/min. Monitor for shock and treat if necessary ... . Anticipate seizures and treat if necessary ... . For eye contamination, flush eyes immediately with water. Irrigate each eye continuously with normal saline during transport ... . Do not use emetics. For ingestion, rinse mouth and administer 5 ml/kg up to 200 ml of water for dilution if the patent can swallow, has a strong gag reflex, and does not drool. Administer activated charcoal ... . /Aniline and related compounds/

Human Toxicity Excerpts:

>> ... THE OCCURRENCE OF BLADDER TUMORS AMONG WORKERS EMPLOYED FROM 1912-1962 IN BRITISH CO WHERE COAL-TAR DYES WERE MADE /WAS EXAMINED/. AMONG 76 WORKERS EXPOSED TO BENZIDINE ALONE, 17 DEVELOPED BLADDER MALIGNANCIES (TOTAL INCIDENCE, 21.3%). MEAN AGE AT DIAGNOSIS OF TUMOR WAS 49.7 YR, & THE MEAN INDUCTION PERIOD WAS 18.7 YR (RANGE, 5-33 YR).

Non-Human Toxicity Excerpts:

>> SEVEN DOGS WERE GIVEN TOTAL DOSE OF 325 G /ORALLY/ OVER 5 YR (200 & THEN 300 MG/DAY, ON 6 DAYS/WK). THREE ... DEVELOPED BLADDER CARCINOMA 7, 8 & 9 YR AFTER START OF TREATMENT.

Human Toxicity Values:

Quantitative human toxicity values (e.g., lethal dose) for this compound.

>> Inhalation cancer potency factor: 2.3X10+2 (mg/kg/day)-1

Non-Human Toxicity Values:

>> LD50 Rat oral 309 mg/kg

Populations at Special Risk:

>> Preclude from exposure those individuals with diseases of the bladder.

12. Ecological Information

Resident Soil (mg/kg)

>> 5.30e-04

Industrial Soil (mg/kg)

>> 1.00e-02

Resident Air (ug/m3)

>> 1.5e-05

Industrial Air (ug/m3)

>> 1.80e-04

Tapwater (ug/L)

>> 1.10e-04

MCL (ug/L)

>> 5.00e+00

Risk-based SSL (mg/kg)

>> 2.8e-07

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

>> 2.30e+02

Inhalation Unit Risk (ug/m3)-1

>> 6.70e-02

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 very toxic 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.

>> Buffalo River watershed-not detected in 21 samples from 7 sites upstream and downstream from Allied Chemical plant where benzidine was believed to have been discharged(1). Benzidene was not detected in 3240 sediment/soil samples contained in the EPA STORET database(2).

Fish/Seafood Concentrations:

Concentrations of this compound in fish or seafood.

>> Benzidene was not detected in 110 stations reporting biota levels in the EPA STORET database(1).

13. Disposal Considerations

Spillage Disposal

>> Personal protection: chemical protection suit including self-contained breathing apparatus. 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

>> Generators of waste (equal to or greater than 100 kg/mo) containing this contaminant, EPA hazardous waste number U021, must conform with USEPA regulations in storage, transportation, treatment and disposal of waste.

>> A potential candidate for rotary kiln incineration at a temperature range of 820 to 1,600 °C and residence times of seconds for liquids and gases, and hours for solids. A potential candidate for fluidized bed incineration at a temperature range of 450 to 980 °C and residence times of seconds for liquids and gases, and longer for solids.

>> The following wastewater treatment technologies have been investigated for benzidine: Concentration process: Biological treatment.

>> This compound should be susceptible to removal from waste water by air stripping.

>> For more Disposal Methods (Complete) data for BENZIDINE (12 total), please visit the HSDB record page.

14. Transport Information

DOT

Benzidine
6.1
UN Pack Group: II
Reportable Quantity of 1 lb or 0

IATA

Benzidine
6.1,
UN Pack Group: II

15. Regulatory Information

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.

>> Toxic pollutant designated pursuant to section 307(a)(1) of the Federal Water Pollution Control Act and is subject to effluent limitations.

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.

>> Pursuant to section 8(d) of TSCA, EPA promulgated a model Health and Safety Data Reporting Rule. The section 8(d) model rule requires manufacturers, importers, and processors of listed chemical substances and mixtures to submit to EPA copies and lists of unpublished health and safety studies. 1,1'-Biphenyl-4,4'-diamine is included on this list.

Regulatory Information

The Australian Inventory of Industrial Chemicals

>> Chemical: [1,1'-Biphenyl]-4,4'-diamine

REACH Restricted Substance

>> Restricted substance: Benzidine

>> EC: 202-199-1

New Zealand EPA Inventory of Chemical Status

>> [1,1'-Biphenyl]-4,4'-diamine: Does not have an individual approval but may be used as a component in a product covered by a group standard. It is not approved for use as a chemical in its own right.

16. Other Information

Toxic Combustion Products:

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

>> Toxic oxides of nitrogen are produced during the combustion of benzidine.

Other Safety Information

Chemical Assessment

>> IMAP assessments - [1,1'-Biphenyl]-4,4'-diamine: Environment tier I assessment

>> IMAP assessments - [1,1'-Biphenyl]-4,4'-diamine: 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."