1. PRODUCT AND COMPANY IDENTIFICATION
Product name: Benzidine
Product Number: B3503
Brand: Sigma
Supplier: Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA
Telephone: +1 800-325-5632
Fax: +1 800-325-5052
Emergency Phone # (For both supplier and manufacturer): (314) 776-8555
Preparation Information: Sigma-Aldrich Corporation
Product Safety - Americas Region
1-800-321-9956

2. HAZARDS IDENTIFICATION
Emergency Overview
OSHA Hazards
Carcinogen, Target Organ Effect, Toxic by ingestion
Target Organs
Liver, Kidney
GHS Classification
Acute toxicity, Oral (Category 4)
Carcinogenicity (Category 1A)
Acute aquatic toxicity (Category 1)
GHS Label elements, including precautionary statements
Pictogram
Signal word: Danger
Hazard statement(s)
H302: Harmful if swallowed.
H330: May cause cancer.
H410: Very toxic to aquatic life.
Precautionary statement(s)
P201: Obtain special instructions before use.
P273: Avoid release to the environment.
P272, P313: If exposed or concerned: Get medical advice/attention.
HMIS Classification
Health hazard: 2
Chronic Health Hazard: 1
Flammability: 0
Physical hazards: 0

3. COMPOSITION/INFORMATION ON INGREDIENTS
Synonyms: 4,4'-Diaminobiphenyl
Formula: C₁₂H₁₂N₂
Molecular Weight: 184.24 g/mol

Component | Concentration
---|---
Benzidine | 92-87-5
EC-No. | 202-199-1
Index-No. | 612-042-00-2

4. FIRST AID MEASURES
General advice
Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.
If inhaled
If breathed in: move person into fresh air. If not breathing, give artificial respiration. Consult a physician.
In case of skin contact
Wash off with soap and plenty of water. Consult a physician.
In case of eye contact
Flush eyes with water as a precaution.
If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

5. FIREFIGHTING MEASURES
Conditions of flammability
Not flammable or combustible.
Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.
Special protective equipment for firefighters
Wear self-contained breathing apparatus for fire fighting if necessary.
Hazardous combustion products
Hazardous decomposition products formed under fire conditions. - Carbon oxides, nitrogen oxides (NOx)

6. ACCIDENTAL RELEASE MEASURES
Personal precautions
Use personal protective equipment. Avoid dust formation. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.
Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.
7. HANDLING AND STORAGE

Precautions for safe handling
Avoid contact with skin and eyes. Avoid formation of dust and aerosols.
Provide appropriate exhaust ventilation at places where dust is formed.

Conditions for safe storage
Keep container tightly closed in a dry and well-ventilated place.
Light sensitive. Keep in a dry place.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Contains no substances with occupational exposure limit values.

Personal protective equipment

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Hand protection
Handle with gloves. Gloves must be inspected before use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with local and national laws and good laboratory practice. Wash and dry hands.

Eye protection
Safety glasses with side shields conforming to EN166 Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin and body protection
Complete suit protecting against chemicals. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Hygiene measures
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance
Form: powder
Colour: beige

Safety data
pH: no data available
Melting point/freezing point: Melting point/range: 127 °C (259 °F)
Boiling point: 410 °C (772 °F) at 1.013 kPa (760 mmHg)
Flash point: no data available
Ignition temperature: no data available
Autoignition temperature: no data available
Lower explosion limit: no data available

Upper explosion limit: no data available
Vapour pressure: no data available
Density: 1.250 g/cm³ at 20 °C (68 °F)
Water solubility: no data available
Partition coefficient: log Pow: 1.34
Relative vapour density: no data available
Odour: no data available
Odour Threshold: no data available
Evaporation rate: no data available

10. STABILITY AND REACTIVITY

Chemical stability
Stable under recommended storage conditions.

Possibility of hazardous reactions
no data available

Conditions to avoid
no data available

Materials to avoid
Strong oxidizing agents

Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides, nitrogen oxides (NOx)
Other decomposition products: no data available

11. TOXICOLOGICAL INFORMATION

Acute toxicity
Oral LD50
LD50 Oral - rat - 309 mg/kg
Inhalation LC50
no data available
Dermal LD50
no data available

Other information on acute toxicity
no data available

Skin corrosion/irritation
no data available

Serious eye damage/eye irritation
no data available

Respiratory or skin sensitization
no data available

Germ cell mutagenicity
no data available

Carcinogenicity
Repeate absorption may result in bladder tumors. This is or contains a component that has been reported to be carcinogenic based on its IARC, OSHA, ACGIH, NTP, or EPA classification. Human carcinogen.

IARC: 1 - Group 1: Carcinogenic to humans (Benzidine)
NTP: Known to be human carcinogen (Benzidine)

Reproductive toxicity

no data available

Teratogenicity

no data available

Specific target organ toxicity - single exposure (Globally Harmonized System)

no data available

Specific target organ toxicity - repeated exposure (Globally Harmonized System)

no data available

Aspiration hazard

no data available

Potential health effects

Inhalation: May be harmful if inhaled. May cause respiratory tract irritation.
Ingestion: Toxic if swallowed.
Skin: May be harmful if absorbed through skin. May cause skin irritation.
Eyes: May cause eye irritation.

Signs and Symptoms of Exposure
Liver injury may occur, Kidney injury may occur, Blood disorders, Nausea, Vomiting

Synergistic effects

no data available

Additional information
RTECS: DC0625000

12. ECOLOGICAL INFORMATION

Toxicity
Toxicity to fish: LC50 - Oncorhynchus mykiss (rainbow trout) - 7.4 mg/L - 96.0 h

Persistence and degradability
Bioaccumulative potential
Bioaccumulation: Leuciscus idus (Golden orfe) - 3 d
Bioconcentration factor (BCF): 60

Mobility in soil
no data available

PBT and vPvB assessment

no data available

13. DISPOSAL CONSIDERATIONS

Product
Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 1885 Class: 6.1
Proper shipping name: Benzidine
Reportable Quantity (RQ): 1 lb
Marine pollutant: No
Poison Inhalation Hazard: No

IMDG
UN number: 1885 Class: 6.1
Proper shipping name: BENZIDINE
Marine pollutant: No
EMS-No: F-A, S-A

IATA
UN number: 1885 Class: 6.1
Proper shipping name: Benzidine
Packing group: II

15. REGULATORY INFORMATION

OSHA Hazards
Carcinogen, Target Organ Effect, Toxic by ingestion

SARA 302 Components
SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III. Section 302.

SARA 313 Components
The following components are subject to reporting levels established by SARA Title III, Section 313:
CASH No. 92-87-5
Revision Date 2007-07-01

SARA 311/312 Hazards
Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

Benzidine
CAS No. 92-87-5
Revision Date 2007-07-01

Pennsylvania Right To Know Components

Benzidine
CAS No. 92-87-5
Revision Date 2007-07-01

New Jersey Right To Know Components

Benzidine
CAS No. 92-87-5
Revision Date 2007-07-01

California Prop. 65 Components
WARNING! This product contains a chemical known to the State of

no data available

Other adverse effects
An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Very toxic to aquatic life.

no data available

Sig: - 83503
Delivery 0846870153-000010 Purchase Order CC01171WARJNEK

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16. OTHER INFORMATION

Further information
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