1 Identification

- Product identifier
- **Trade name:** benzidine
- **Part number:** N-2911-500MG
- **CAS Number:** 92-87-5
- **EC number:** 202-199-1
- **Index number:** 612-042-00-2
- **Application of the substance / the mixture** Laboratory chemicals

2 Hazard(s) identification

- **Classification of the substance or mixture**
  - GHS08 Health hazard
  - Carc. 1A H350 May cause cancer.
  - ! GHS07
  - Acute Tox. 4 H302 Harmful if swallowed.

- **Label elements**
  - GHS label elements
  - The substance is classified and labeled according to the Globally Harmonized System (GHS).

- **Hazard pictograms**
  - ! GHS07
  - ! GHS08

- **Signal word** Danger

- **Hazard-determining components of labeling:**
  - benzidine

(Contd. on page 2)
 Trade name: benzidine

45.2.5

· Hazard statements
  Harmful if swallowed.
  May cause cancer.

· Precautionary statements
  Obtain special instructions before use.
  Do not handle until all safety precautions have been read and understood.
  Wash thoroughly after handling.
  Do not eat, drink or smoke when using this product.
  Wear protective gloves/protective clothing/eye protection/face protection.
  IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell.
  IF exposed or concerned: Get medical advice/attention.
  Rinse mouth.
  Store locked up.
  Dispose of contents/container in accordance with local/regional/national/international regulations.

· Classification system:
  · NFPA ratings (scale 0 - 4)
    Health = 2
    Fire = 0
    Reactivity = 0

  · HMIS-ratings (scale 0 - 4)
    HEALTH
    Fire = *2
    Reactivity = 0

· Other hazards
  · Results of PBT and vPvB assessment
    · PBT: Not applicable.
    · vPvB: Not applicable.

3 Composition/information on ingredients

· Chemical characterization: Substances
  · CAS No. Description
    92-87-5 benzidine

· Identification number(s)
  · EC number: 202-199-1
  · Index number: 612-042-00-2

4 First-aid measures

· Description of first aid measures
  · General information:
    Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident.
  · After inhalation: Supply fresh air; consult doctor in case of complaints.
  · After skin contact: Generally the product does not irritate the skin.
  · After eye contact: Rinse opened eye for several minutes under running water.
  · After swallowing: Immediately call a doctor.
  · Information for doctor:
    · Most important symptoms and effects, both acute and delayed No further relevant information available.
Trade name: benzidine

5 Fire-fighting measures

- Extinguishing media
- Suitable extinguishing agents: Use fire fighting measures that suit the environment.
- Special hazards arising from the substance or mixture: No further relevant information available.
- Advice for firefighters
- Protective equipment: No special measures required.

6 Accidental release measures

- Personal precautions, protective equipment and emergency procedures: Not required.
- Environmental precautions: Do not allow to enter sewers/surface or ground water.
- Methods and material for containment and cleaning up:
  Dispose contaminated material as waste according to item 13.
  Ensure adequate ventilation.
- Reference to other sections
  See Section 7 for information on safe handling.
  See Section 8 for information on personal protection equipment.
  See Section 13 for disposal information.
- Protective Action Criteria for Chemicals

<table>
<thead>
<tr>
<th>PAC</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAC-1</td>
<td>0.93 mg/m3</td>
</tr>
<tr>
<td>PAC-2</td>
<td>10 mg/m3</td>
</tr>
<tr>
<td>PAC-3</td>
<td>61 mg/m3</td>
</tr>
</tbody>
</table>

7 Handling and storage

- Handling:
- Precautions for safe handling
  Ensure good ventilation/exhaustion at the workplace.
  Open and handle receptacle with care.
- Information about protection against explosions and fires: Keep respiratory protective device available.
- Conditions for safe storage, including any incompatibilities
- Storage:
  - Requirements to be met by storerooms and receptacles: No special requirements.
  - Information about storage in one common storage facility: Not required.
  - Further information about storage conditions: Keep receptacle tightly sealed.
  - Specific end use(s): No further relevant information available.

8 Exposure controls/personal protection

- Additional information about design of technical systems: No further data; see item 7.
Trade name: benzidine

- Control parameters
  - Components with limit values that require monitoring at the workplace:
    92-87-5 benzidine
    PEL  see 29 CFR 1910.1003
    REL  See Pocket Guide Apps. A and C
    TLV  Skin; L
  
- Additional information: The lists that were valid during the creation were used as basis.
- Exposure controls
- Personal protective equipment:
  - General protective and hygienic measures:
    Keep away from foodstuffs, beverages and feed.
    Wash hands before breaks and at the end of work.
    Store protective clothing separately.
  - Breathing equipment:
    In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use respiratory protective device that is independent of circulating air.
  - Protection of hands:
    Protective gloves
    The glove material has to be impermeable and resistant to the product/ the substance/ the preparation. Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.
    Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation
  - Material of gloves
    The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.
  - Penetration time of glove material
    The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.
  - Eye protection:
    Tightly sealed goggles

9 Physical and chemical properties

- Information on basic physical and chemical properties
- General Information
  - Appearance:
    Form: Solid
    Color: Not determined.
  - Odor:
    Characteristic
  - Odor threshold:
    Not determined.
  - pH-value:
    Not applicable.
Trade name: benzidine

10 Stability and reactivity

- Reactivity: No further relevant information available.
- Chemical stability: No further relevant information available.
- Thermal decomposition / conditions to be avoided: No decomposition if used according to specifications.
- Possibility of hazardous reactions: No dangerous reactions known.
- Conditions to avoid: No further relevant information available.
- Incompatible materials: No further relevant information available.
- Hazardous decomposition products: No dangerous decomposition products known.

11 Toxicological information

- Information on toxicological effects
- Acute toxicity:

  - LD/LC50 values that are relevant for classification:

    ATE (Acute Toxicity Estimate)
    Oral LD50 309 mg/kg (rat)
Trade name: benzidine

92-87-5 benzidine

Oral LD50 309 mg/kg (rat)

- Primary irritant effect:
  - on the skin: No irritant effect.
  - on the eye: No irritating effect.
  - Sensitization: No sensitizing effects known.

- Additional toxicological information:

  - Carcinogenic categories
  - IARC (International Agency for Research on Cancer)
    1
  - NTP (National Toxicology Program)
    K
  - OSHA-Ca (Occupational Safety & Health Administration)
    Substance is listed.

12 Ecological information

- Toxicity
  - Aquatic toxicity: No further relevant information available.
  - Persistence and degradability: No further relevant information available.
  - Behavior in environmental systems:
  - Bioaccumulative potential: No further relevant information available.
  - Mobility in soil: No further relevant information available.

- Additional ecological information:

  - General notes:
    Water hazard class 3 (Assessment by list): extremely hazardous for water
    Do not allow product to reach ground water, water course or sewage system, even in small quantities.
    Danger to drinking water if even extremely small quantities leak into the ground.
  - Results of PBT and vPvB assessment
    - PBT: Not applicable.
    - vPvB: Not applicable.
  - Other adverse effects: No further relevant information available.

13 Disposal considerations

- Waste treatment methods
  - Recommendation:
    Must not be disposed of together with household garbage. Do not allow product to reach sewage system.
  - Uncleaned packagings:
    - Recommendation: Disposal must be made according to official regulations.

14 Transport information

- UN-Number
- DOT, IMDG, IATA
  UN1885
<table>
<thead>
<tr>
<th>Trade name: benzidine</th>
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</thead>
</table>

- **UN proper shipping name**
  - **DOT**: Benzidine
  - **IMDG, IATA**: BENZIDINE

- **Transport hazard class(es)**
  - **DOT**
    - **Class**: 6.1 Toxic substances
    - **Label**: 6.1
  - **IMDG, IATA**
    - **Class**: 6.1 Toxic substances
    - **Label**: 6.1

- **Packing group**
  - **DOT, IMDG, IATA**: II

- **Environmental hazards:**
  - Not applicable.

- **Special precautions for user**
  - **Warning**: Toxic substances
  - **Danger code (Kemler)**: 60
  - **EMS Number**: 6.1-04
  - **Stowage Category**: A

- **Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code**
  - Not applicable.

- **Transport/Additional information**
  - **DOT**
    - **Quantity limitations**: On passenger aircraft/rail: 25 kg
      On cargo aircraft only: 100 kg
    - **Hazardous substance**: 1 lbs, 0.454 kg
  - **IMDG**
    - **Limited quantities (LQ)**: 500 g
    - **Excepted quantities (EQ)**
      - Code: E4
      - Maximum net quantity per inner packaging: 1 g
      - Maximum net quantity per outer packaging: 500 g
  - **UN "Model Regulation"**: UN 1885 BENZIDINE, 6.1, II, ENVIRONMENTALLY HAZARDOUS

(Contd. on page 8)
### 15 Regulatory information

- **Safety, health and environmental regulations/legislation specific for the substance or mixture**
- **Sara**
  - **Section 355 (extremely hazardous substances):**
    Substance is not listed.
  - **Section 313 (Specific toxic chemical listings):**
    Substance is listed.
- **TSCA (Toxic Substances Control Act):**
  Substance is listed.
- **Proposition 65**
  - **Chemicals known to cause cancer:**
    Substance is listed.
  - **Chemicals known to cause reproductive toxicity for females:**
    Substance is not listed.
  - **Chemicals known to cause reproductive toxicity for males:**
    Substance is not listed.
  - **Chemicals known to cause developmental toxicity:**
    Substance is not listed.
- **Carcinogenic categories**
  - **EPA (Environmental Protection Agency)**
    - TLV (Threshold Limit Value established by ACGIH) A
  - **NIOSH-Ca (National Institute for Occupational Safety and Health)**
    Substance is listed.
- **GHS label elements**
  The substance is classified and labeled according to the Globally Harmonized System (GHS).
- **Hazard pictograms**
  
  ![GHS07](image1) ![GHS08](image2)

- **Signal word** Danger
- **Hazard-determining components of labeling:** benzidine
- **Hazard statements**
  - Harmful if swallowed.
  - May cause cancer.
- **Precautionary statements**
  - Obtain special instructions before use.
  - Do not handle until all safety precautions have been read and understood.
  - Wash thoroughly after handling.
  - Do not eat, drink or smoke when using this product.
  - Wear protective gloves/protective clothing/eye protection/face protection.
Trade name: benzidine

IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell.
IF exposed or concerned: Get medical advice/attention.
Rinse mouth.
Store locked up.
Dispose of contents/container in accordance with local/regional/national/international regulations.

- National regulations:
- Additional classification according to Decree on Hazardous Materials:
  Carcinogenic hazardous material group I (extremely dangerous).
  Carcinogenic hazardous material group II (very dangerous).
  Carcinogenic hazardous material group III (dangerous).

- Information about limitation of use:
  Workers are not allowed to be exposed to this hazardous material. Exceptions can be made by the authorities in certain cases.
- Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

- Date of preparation / last revision 10/31/2017 / -
- Abbreviations and acronyms:
  ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
  IMDG: International Maritime Code for Dangerous Goods
  DOT: US Department of Transportation
  IATA: International Air Transport Association
  ACGIH: American Conference of Governmental Industrial Hygienists
  EINECS: European Inventory of Existing Commercial Chemical Substances
  CAS: Chemical Abstracts Service (division of the American Chemical Society)
  NFPA: National Fire Protection Association (USA)
  HMIS: Hazardous Materials Identification System (USA)
  VOC: Volatile Organic Compounds (USA, EU)
  LC50: Lethal concentration, 50 percent
  LD50: Lethal dose, 50 percent
  PBT: Persistent, Bioaccumulative and Toxic
  vPvB: very Persistent and very Bioaccumulative
  NIOSH: National Institute for Occupational Safety
  OSHA: Occupational Safety & Health
  TLV: Threshold Limit Value
  PEL: Permissible Exposure Limit
  REL: Recommended Exposure Limit
  Acute Tox. 4: Acute toxicity – Category 4
  Carc. 1A: Carcinogenicity – Category 1A