Material Safety Data Sheet

Vitamin B1 HPLC

Catalog Number: 30-2201
Safety Data Sheet

MSDS ACCORDING TO REGULATION (EC) NO. 1907/2006

Version 1.1
Revision Date 2009-05-07
Print Date 2009-05-12
NO COUNTRY SPECIFIC DATA

1. Name of compound/preparation and manufacturer

1.1. Name of product: Vitamin B1 HPLC Kit
1.2. Number of product: KC 2201
1.3. Manufacturer: Immundiagnostik AG
Stubenwald-Allee 8a
64625 Bensheim
Germany
1.4. Manufacturer’s contact phone: +49-6251-701-900
1.5. Poison control center (US): 1-800-222-1222 (toll free)

2. Composition / Declaration of components

2.1. Chemical characterization of the preparation:
Liquids
2.2. Dangerous ingredients:

<table>
<thead>
<tr>
<th>Reagent</th>
<th>CAS No</th>
<th>EC No</th>
<th>EC-Index No</th>
<th>Classification</th>
<th>Content [%]</th>
<th>Special instruction see on</th>
</tr>
</thead>
<tbody>
<tr>
<td>Precipitation Reagent - Perchloric Acid</td>
<td>7601-90-3</td>
<td>231-512-4</td>
<td>017-006-00-4</td>
<td>O,C, R5-8-35</td>
<td>&lt; 10</td>
<td>SHEET 12</td>
</tr>
<tr>
<td>Derivatisation Reagent - Potassium hexacyanoferrate(III)</td>
<td>13746-66-2</td>
<td>237-323-3</td>
<td>--</td>
<td>R32</td>
<td>&lt; 10</td>
<td>SHEET 5</td>
</tr>
<tr>
<td>Mobile Phase - Acetonitrile</td>
<td>75-05-8</td>
<td>200-835-2</td>
<td>608-001-00-3</td>
<td>F, Xn, R11-20/21/22 - R36</td>
<td>&lt; 10</td>
<td>SHEET 2</td>
</tr>
<tr>
<td>Mobile Phase - Dibutylamine</td>
<td>111-92-2</td>
<td>203-921-8</td>
<td>612-049-00-0</td>
<td>Xn, R10 - R20/21/22</td>
<td>&lt; 0.1</td>
<td>SHEET 6</td>
</tr>
<tr>
<td>Reaction Buffer - Ethylenediaminetetraacetic acid</td>
<td>60-00-4</td>
<td>200-449-4</td>
<td>--</td>
<td>Xi, R36 - R52/53</td>
<td>&lt; 0.5</td>
<td>SHEET 7</td>
</tr>
<tr>
<td>Solution C - Sodium hydroxide</td>
<td>1310-73-2</td>
<td>215-185-5</td>
<td>011-002-00-6</td>
<td>C, R35</td>
<td>&lt; 10</td>
<td>SHEET 18</td>
</tr>
</tbody>
</table>
1 - Identification of the Substance

Name                  PERCHLORIC ACID

2 - Hazards Identification

SPECIAL INDICATION OF HAZARDS TO HUMANS AND THE ENVIRONMENT
• Heating may cause an explosion. Contact with combustible material may cause fire. Causes severe burns.

3 - Composition/Information on Ingredients

<table>
<thead>
<tr>
<th>Product Name</th>
<th>PERCHLORIC ACID</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAS No</td>
<td>7601-90-3</td>
</tr>
<tr>
<td>EC No</td>
<td>231-512-4</td>
</tr>
<tr>
<td>EC Index No</td>
<td>017-006-00-4</td>
</tr>
<tr>
<td>Formula</td>
<td>HClO4</td>
</tr>
<tr>
<td>Molecular Weight</td>
<td>100.46 g/mol</td>
</tr>
</tbody>
</table>

4 - First Aid Measures

AFTER INHALATION
• If inhaled, remove to fresh air. If breathing becomes difficult, call a physician.

AFTER SKIN CONTACT
• In case of skin contact, flush with copious amounts of water for at least 15 minutes. Remove contaminated clothing and shoes. Call a physician.

AFTER EYE CONTACT
• In case of contact with eyes, flush with copious amounts of water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Call a physician.

AFTER INGESTION
• If swallowed, wash out mouth with water provided person is conscious. Call a physician.

5 - Fire Fighting Measures

EXTINGUISHING MEDIA
• Suitable: Carbon dioxide, dry chemical powder, or appropriate foam.

SPECIAL RISKS
• Specific Hazard(s): Emits toxic fumes under fire conditions. Contact with other material may cause fire. May accelerate combustion.

SPECIAL PROTECTIVE EQUIPMENT FOR FIREFIGHTERS
• Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

**6 - Accidental Release Measures**

PERSONAL PRECAUTION PROCEDURES TO BE FOLLOWED IN CASE OF LEAK OR SPILL
• Evacuate area.

PROCEDURE(S) OF PERSONAL PRECAUTION(S)
• Wear self-contained breathing apparatus, rubber boots, and heavy rubber gloves.

METHODS FOR CLEANING UP
• Cover with dry lime or soda ash, pick up, keep in a closed container, and hold for waste disposal. Ventilate area and wash spill site after material pickup is complete.

**7 - Handling and Storage**

HANDLING
• Directions for Safe Handling: Do not breathe vapor. Do not get in eyes, on skin, on clothing. Avoid prolonged or repeated exposure.

STORAGE
• Conditions of Storage: Keep tightly closed. Keep away from combustible materials, heat, sparks, and open flame.

**8 - Exposure Controls / Personal Protection**

ENGINEERING CONTROLS
• Use only in a chemical fume hood. Safety shower and eye bath.

GENERAL HYGIENE MEASURES
• Wash thoroughly after handling. Remove and wash contaminated clothing promptly.

EXPOSURE LIMITS

<table>
<thead>
<tr>
<th>Country</th>
<th>Source</th>
<th>Type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poland</td>
<td>NDS</td>
<td>1 MG/M3</td>
<td></td>
</tr>
<tr>
<td>Poland</td>
<td>NDSCh</td>
<td>3 MG/M3</td>
<td></td>
</tr>
<tr>
<td>Poland</td>
<td>NDSP</td>
<td>-----</td>
<td></td>
</tr>
</tbody>
</table>

PERSONAL PROTECTIVE EQUIPMENT
• Respiratory Protection: Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU). Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator
cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator.

- Hand Protection: Compatible chemical-resistant gloves.
- Eye Protection: Chemical safety goggles.

9 Physical and Chemical Properties

- Appearance: Physical State: Clear liquid  Color: Colorless

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
<th>At Temperature or Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>BP/BP Range</td>
<td>203 °C</td>
<td></td>
</tr>
<tr>
<td>MP/MP Range</td>
<td>-18.0 °C</td>
<td></td>
</tr>
<tr>
<td>Flash Point</td>
<td>113 °C</td>
<td>Method: closed cup</td>
</tr>
<tr>
<td>Flammability</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Autoignition Temp</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Oxidizing Properties</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Explosive Properties</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Explosion Limits</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Vapor Pressure</td>
<td>6.8 mmHg</td>
<td>25 °C</td>
</tr>
<tr>
<td>SG/Density</td>
<td>1.67 g/cm³</td>
<td></td>
</tr>
<tr>
<td>Partition Coefficient</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Viscosity</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Vapor Density</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Saturated Vapor Conc.</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Evaporation Rate</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Bulk Density</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Decomposition Temp.</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Solvent Content</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Water Content</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Surface Tension</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Conductivity</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Miscellaneous Data</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Solubility</td>
<td>N/A</td>
<td></td>
</tr>
</tbody>
</table>

10 - Stability and Reactivity

STABILITY

- Stable: Stable.
- Conditions of Instability: Although 68-72% cold perchloric acid behaves as a strong but nonoxidizing acid, it becomes an extreme oxidant and powerful dehydrator at elevated temperatures (>160°C) or when anhydrous. It may be fairly readily dehydrated to the anhydrous acid, e.g. strong concentrated acids (sulfuric, oleum, fuming nitric), inorganic anhydrides (sulfur trioxide and dioxide, phosphorous pentoxide, thionyl chloride, etc.), organic anhydrides, and halogens. Contact with alcohols, glycols, or polyhydroxy compounds produce explosive compounds. Contact with wood, cellulose, and its derivatives (paper, cardboard, etc.) can
produce violent explosions. Attempts to dissolve bismuth or its alloys in hot perchloric acid carries a very high risk of an explosion occurring. Contact with sulfoxides or ethers may produce explosions. The crystalline salt obtained by the action of phosphine on 68% perchloric acid at -20°C is dangerously explosive, sensitive to moist air, increase in temperature, or friction, and cannot be dried. Violent reactions with trichlorethylene, sodium phosphinate, zinc phosphate, organophosphorous compounds, and unsaturated organics have occurred on heating with perchloric acid


HAZARDOUS DECOMPOSITION PRODUCTS
- Hazardous Decomposition Products: Chlorine.

HAZARDOUS POLYMERIZATION
- Hazardous Polymerization: Will not occur

**11 - Toxicological Information**

RTECS NUMBER: SC7500000

ACUTE TOXICITY

LD50 Oral Rat 1100 mg/kg

LD50 Subcutaneous Mouse 250 MG/KG

LD50 Oral Dog 400 mg/kg

SIGNS AND SYMPTOMS OF EXPOSURE
Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin. Inhalation may result in spasm, inflammation and edema of the larynx and bronchi, chemical pneumonitis, and pulmonary edema. Symptoms of exposure may include burning sensation, coughing, wheezing, laryngitis, shortness of breath, headache, nausea, and vomiting. To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

ROUTE OF EXPOSURE
- Skin Contact: Causes severe burns.
- Skin Absorption: May be harmful if absorbed through the skin.
- Eye Contact: Causes severe burns.
- Inhalation: May be harmful if inhaled. Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract.
- Ingestion: Harmful if swallowed.

12 - Ecological Information

No data available.

13 - Disposal Considerations

SUBSTANCE DISPOSAL
Contact a licensed professional waste disposal service to dispose of this material. Observe all federal, state, and local environmental regulations.

14 - Transport Information

RID/ADR
UN#: 1873
Class: 5.1
PG: I
Subrisk: 8
Proper Shipping Name: Perchloric acid

IMDG
UN#: 1873
Class: 5.1
PG: I
Subrisk: 8
Proper Shipping Name: Perchloric acid
Marine Pollutant: No
Severe Marine Pollutant: No

IATA
UN#: 1873
Class: 5.1
PG: I
Subrisk: 8
Proper Shipping Name: Perchloric acid
Inhalation Packing Group I: No

15 - Regulatory Information

CLASSIFICATION AND LABELING ACCORDING TO EU DIRECTIVES
ANNEX I INDEX NUMBER: 017-006-00-4
NOTA: B
INDICATION OF DANGER: O-C
Oxidizing. Corrosive.
R-PHRASES: 5-8-35
Heating may cause an explosion. Contact with combustible material may cause fire. Causes severe burns.
S-PHRASES: 23-26-36-45
Do not breathe vapor. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear
suitable protective clothing. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

COUNTRY SPECIFIC INFORMATION

Germany
WGK: 1
ID-Number: 390
KBwS-Decision

NORWAY
Declaration Number: 66088
1 - IDENTIFICATION OF THE SUBSTANCE

Name                  Potassium hexacyanoferrate (III)

2 - Hazards Identification

Risk advice to man and the environment
Contact with acids liberates very toxic gas.

3 - Composition/Information on Ingredients

Synonyms :      Red prussiate
Potassium ferricyanide

Formula:            C6FeK3N6
Molecular Weight :  329.24 g/mol

<table>
<thead>
<tr>
<th>Reagent</th>
<th>CAS No</th>
<th>EC No</th>
<th>EC-Index No</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potassium hexacyanoferrate(III)</td>
<td>13746-66-2</td>
<td>237-323-3</td>
<td>-</td>
<td>R32</td>
</tr>
</tbody>
</table>

4 - First Aid Measures

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 - Fire Fighting Measures

Suitable extinguishing media
  • Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Special protective equipment for fire-fighters
  • Wear self contained breathing apparatus for fire fighting if necessary.
6 - Accidental Release Measures

Personal precautions
- Wear respiratory protection. Avoid dust formation.

Environmental precautions
- Do not let product enter drains.

Methods for cleaning up
- Pick up and arrange disposal without creating dust. Keep in suitable, closed containers for disposal.

7 - Handling and Storage

Handling
- Provide appropriate exhaust ventilation at places where dust is formed. Normal measures for preventive fire protection.

Storage
- Store in cool place. Keep container tightly closed in a dry and well-ventilated place.
- Do not store near acids.

8 - Exposure Controls / Personal Protection

Personal protective equipment
- Respiratory protection: Respiratory protection is not required. Where protection from nuisance levels of dusts are desired, use type N95 (US) or type P1 (EN 143) dust masks. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

- Hand protection: The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it. Handle with gloves.

- Eye protection: Safety glasses

- Skin and body protection: Choose body protection according to the amount and concentration of the dangerous substance at the work place.

- 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: crystalline  Colour: red
Safety data

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>6.0 - 9 at 329 g/l at 25 °C</td>
</tr>
<tr>
<td>Melting point</td>
<td>no data available</td>
</tr>
<tr>
<td>Boiling point</td>
<td>no data available</td>
</tr>
<tr>
<td>Flash point</td>
<td>no data available</td>
</tr>
<tr>
<td>Ignition temperature</td>
<td>no data available</td>
</tr>
<tr>
<td>Lower explosion limit</td>
<td>no data available</td>
</tr>
<tr>
<td>Upper explosion limit</td>
<td>no data available</td>
</tr>
<tr>
<td>Density</td>
<td>1,890 g/cm³</td>
</tr>
<tr>
<td>Water solubility</td>
<td>329 g/l at 20 °C - completely soluble</td>
</tr>
</tbody>
</table>

10 - Stability and Reactivity

Storage stability
- May discolor on exposure to light. Stable under recommended storage conditions.

Materials to avoid
- Strong acids, Strong oxidizing agents, Ammonia, hydrochloric acid, Cyanides

Hazardous decomposition products
- Hazardous decomposition products formed under fire conditions. - Carbon oxides, nitrogen oxides (NOx), Hydrogen cyanide (hydrocyanic acid)

11 - Toxicological Information

ACUTE TOXICITY
LD50 Oral - mouse - 2.970 mg/kg

Irritation and corrosion
no data available

Sensitisation
no data available

Chronic exposure
IARC: No component of this product presents at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

Signs and Symptoms of Exposure
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Potential Health Effects

<table>
<thead>
<tr>
<th>Exposure</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inhalation</td>
<td>May be harmful if inhaled. May cause respiratory tract irritation.</td>
</tr>
<tr>
<td>Skin</td>
<td>May be harmful if absorbed through skin. May cause skin irritation.</td>
</tr>
<tr>
<td>Eyes</td>
<td>May cause eye irritation.</td>
</tr>
<tr>
<td>Ingestion</td>
<td>May be harmful if swallowed.</td>
</tr>
</tbody>
</table>
Additional Information
RTECS: LJ8225000

12 - Ecological Information
Elimination information (persistence and degradability)
No data available

Ecotoxicity effects

<table>
<thead>
<tr>
<th>Toxicity to fish</th>
<th>LC50 - Oncorhynchus mykiss (rainbow trout) - 869 mg/l - 96 h</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toxicity to daphnia and other aquatic invertebrates.</td>
<td>EC50 - Daphnia magna (Water flea) - 549 mg/l - 48 h</td>
</tr>
</tbody>
</table>

Further information on ecology
No data available.

13 - Disposal Considerations

Product
- 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. Observe all federal, state, and local environmental regulations.

Contaminated packaging
- Dispose of as unused product.

14 - Transport Information

ADR/RID
Not dangerous goods

IMDG
Not dangerous goods

IATA
Not dangerous goods

15 - Regulatory Information

Labelling according to EC Directives

R-phrase(s)
R32 | Contact with acids liberates very toxic gas.
1 - IDENTIFICATION OF THE SUBSTANCE

Name               Acetonitrile

2 - Hazards Identification

Risk advice to man and the environment

• Highly flammable. Harmful by inhalation, in contact with skin and if swallowed. Irritating to eyes.

3 - Composition/Information on Ingredients

Formula :                             C2H3N
Molecular Weight :            41,05 g/mol

<table>
<thead>
<tr>
<th>Reagent</th>
<th>CAS No</th>
<th>EC No</th>
<th>EC-Index No</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acetonitrile</td>
<td>75-05-8</td>
<td>200-835-2</td>
<td>608-001-00-3</td>
<td>F, Xn, R11-20/21/22-R36</td>
</tr>
</tbody>
</table>

4 - First Aid Measures

General advice

• Consult a physician. Show this safety data sheet to the doctor in attendance.

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

• Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed

• Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

5 - Fire Fighting Measures

Suitable extinguishing media

• For small (incipient) fires, use media such as "alcohol" foam, dry chemical, or carbon dioxide. For large fires, apply water from as far as possible. Use very large quantities (flooding) of water applied as a mist or spray; solid streams of water may be ineffective. Cool all affected containers with flooding quantities of water.
Special protective equipment for fire-fighters

- Wear self contained breathing apparatus for fire fighting if necessary.

Further information

- Use water spray to cool unopened containers.

6 - Accidental Release Measures

Personal precautions

- Use personal protective equipment. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.

Environmental precautions

- Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

Methods for cleaning up

- Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13).

7 - Handling and Storage

Handling

- Avoid contact with skin and eyes. Avoid inhalation of vapour or mist. Keep away from sources of ignition - No smoking. Take measures to prevent the build up of electrostatic charge.

Storage

- Store in cool place. Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

Handle and store under inert gas.

8 - Exposure Controls / Personal Protection

Personal protective equipment

- Respiratory protection: Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multipurpose combination (US) or type ABEK (EN 14387) 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: The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it. Handle with gloves.

Eye protection: Safety glasses

Skin and body protection: Choose body protection according to the amount and concentration of the dangerous substance at the work place.

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

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance: Form</td>
<td>liquid, clear</td>
</tr>
<tr>
<td>Colour</td>
<td>colourless</td>
</tr>
<tr>
<td>Odour</td>
<td>pungent</td>
</tr>
<tr>
<td>pH</td>
<td>no data available</td>
</tr>
<tr>
<td>Melting point</td>
<td>-48,0 °C</td>
</tr>
<tr>
<td>Boiling point</td>
<td>81,0 - 82,0 °C</td>
</tr>
<tr>
<td>Flash point</td>
<td>2,0 °C - closed cup</td>
</tr>
<tr>
<td>Ignition temperature</td>
<td>523 °C</td>
</tr>
<tr>
<td>Lower explosion limit</td>
<td>4,4 %(V)</td>
</tr>
<tr>
<td>Upper explosion limit</td>
<td>16 %(V)</td>
</tr>
<tr>
<td>Vapour pressure</td>
<td>97,1 hPa at 20,0 °C</td>
</tr>
<tr>
<td>Density</td>
<td>0,78 g/cm³</td>
</tr>
<tr>
<td>Water solubility</td>
<td>soluble</td>
</tr>
<tr>
<td>Partition coefficient: n-octanol/water</td>
<td>log Pow: -0,34</td>
</tr>
</tbody>
</table>

10 - Stability and Reactivity

Storage stability

- Stable under recommended storage conditions.

Conditions to avoid

- Heat, flames and sparks.

Materials to avoid

- acids, Bases, Oxidizing agents, Reducing agents, Alkali metals

Hazardous decomposition products

- Hazardous decomposition products formed under fire conditions. - Carbon oxides, nitrogen oxides (NOx), Hydrogen cyanide (hydrocyanic acid)
11 - Toxicological Information

ACUTE TOXICITY
LD50 Oral - rat - 2.460 mg/kg

LC50 Inhalation - rat - 8 h - 7551 ppm

LD50 Dermal - rabbit - 2.000 mg/kg

Irritation and corrosion
Skin - rabbit - Mild skin irritation
Eyes - rabbit - Severe eye irritation

Sensitisation
no data available

Chronic exposure
This product is or contains a component that is not classifiable as to its carcinogenicity based on its IARC, ACGIH, NTP, or EPA classification.

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

Signs and Symptoms of Exposure
Treat as cyanide poisoning., Always have on hand a cyanide first-aid kit, together with proper instructions., The onset of symptoms is generally delayed pending conversion to cyanide., Nausea, Vomiting, Diarrhoea, Headache, Dizziness, Rash, Cyanosis, excitement, depression, Drowsiness, impaired judgment, Lack of coordination, stupor, death

Potential Health Effects

<table>
<thead>
<tr>
<th>Mode</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inhalation</td>
<td>Harmful if inhaled. May cause respiratory tract irritation.</td>
</tr>
<tr>
<td>Skin</td>
<td>Harmful if absorbed through skin. May cause skin irritation.</td>
</tr>
<tr>
<td>Eyes</td>
<td>Causes eye irritation.</td>
</tr>
<tr>
<td>Ingestion</td>
<td>Harmful if swallowed</td>
</tr>
<tr>
<td>Target Organs</td>
<td>Lungs, Blood, Kidney, Liver, Central nervous system,</td>
</tr>
</tbody>
</table>

Additional Information
RTECS: AL7700000
12 - Ecological Information

Elimination information (persistence and degradability)
no data available

Ecotoxicity effects

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Toxicty to fish</td>
<td>LC50 - Pimephales promelas (fathead minnow) - 1.640,00 mg/l - 96 h</td>
<td></td>
</tr>
<tr>
<td>Toxicty to daphnia and other aquatic invertebrates.</td>
<td>EC50 - Daphnia magna (Water flea) - 3.600,00 mg/l - 48 h</td>
<td></td>
</tr>
<tr>
<td></td>
<td>NOEC - Daphnia magna (Water flea) - 640 mg/l - 14 d</td>
<td></td>
</tr>
</tbody>
</table>

Further information on ecology
No data available.

13 - Disposal Considerations

Product
- Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Observe all federal, state, and local environmental regulations. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging
- Dispose of as unused product.

14 - Transport Information

RID/ADR
UN-Number: 1648
Class: 3
Packing group: II
Proper shipping name: ACETONITRILE

IMDG
UN-Number: 1648
Class: 3
Packing group: II EMS-No: F-E, S-D
Proper shipping name: ACETONITRILE
Marine pollutant: No

IATA
UN-Number: 1648
Class: 3
Packing group: II
Proper shipping name: Acetonitrile
15 - Regulatory Information

Labelling according to EC Directives

EC Label

Hazard symbols

<table>
<thead>
<tr>
<th>F</th>
<th>Highly flammable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Xn</td>
<td>Harmful</td>
</tr>
</tbody>
</table>

R-phrase(s)

| R11 | Highly flammable |
| R20/21/22 | Harmful by inhalation, in contact with skin and if swallowed |
| R36 | Irritating to eyes |

S-phrase(s)

| S16 | Keep away from sources of ignition - No smoking |
| S36/37 | Wear suitable protective clothing and gloves |
1 - IDENTIFICATION OF THE SUBSTANCE

Name                  Dibutylamine

2 - Hazards Identification
Risk advice to man and the environment
- Flammable. Harmful by inhalation, in contact with skin and if swallowed.

3 - Composition/Information on Ingredients

Formula : C8H19N
Molecular Weight : 129.24 g/mol

<table>
<thead>
<tr>
<th>Reagent</th>
<th>CAS No</th>
<th>EC No</th>
<th>EC-Index No</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dibutylamine</td>
<td>111-92-2</td>
<td>203-921-8</td>
<td>612-049-00-0</td>
<td>Xn, R10 - R20/21/22</td>
</tr>
</tbody>
</table>

4 - First Aid Measures

General advice
- Consult a physician. Show this safety data sheet to the doctor in attendance.

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
- Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician

If swallowed
- Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

5 - Fire Fighting Measures

Suitable extinguishing media
- For small (incipient) fires, use media such as "alcohol" foam, dry chemical, or carbon dioxide. For large fires, apply water from as far as possible. Use very large quantities (flooding) of water applied as a mist or spray; solid streams of water may be ineffective. Cool all affected containers with flooding quantities of water.

Special protective equipment for fire-fighters
- Wear self contained breathing apparatus for fire fighting if necessary.
Further information
  • Use water spray to cool unopened containers.

6 - Accidental Release Measures

Personal precautions
  • Use personal protective equipment. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.

Environmental precautions
  • Do not let product enter drains

Methods for cleaning up
Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13). Keep in suitable, closed containers for disposal.

7 - Handling and Storage

Handling
  • Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.
  • Keep away from sources of ignition - No smoking. Take measures to prevent the build up of electrostatic charge.

Storage
  • Store in cool place. Keep container tightly closed in a dry and well-ventilated place.
  • Store under inert gas.

8 - Exposure Controls / Personal Protection

Personal protective equipment
  • Respiratory protection: Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multipurpose combination (US) or type ABEK (EN 14387) 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: The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it. Handle with gloves.
  • Eye protection Safety glasses
  • Skin and body protection: Choose body protection according to the amount and concentration of the dangerous substance at the work place.
  • 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 | liquid, clear
Colour | colourless

Safety data

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>11.1 at 1 g/l at 20 °C</td>
</tr>
<tr>
<td>Melting point</td>
<td>-62 °C</td>
</tr>
<tr>
<td>Boiling point</td>
<td>159 °C</td>
</tr>
<tr>
<td>Flash point</td>
<td>40 °C - closed cup</td>
</tr>
<tr>
<td>Ignition temperature</td>
<td>260 °C</td>
</tr>
<tr>
<td>Lower explosion limit</td>
<td>0.6 % (V)</td>
</tr>
<tr>
<td>Upper explosion limit</td>
<td>6.8 % (V)</td>
</tr>
<tr>
<td>Vapour pressure</td>
<td>2.5 hPa at 20 °C</td>
</tr>
<tr>
<td>Density</td>
<td>0.767 g/mL at 25 °C</td>
</tr>
<tr>
<td>Water solubility</td>
<td>soluble</td>
</tr>
<tr>
<td>Partition coefficient:</td>
<td>log Pow: 2.06</td>
</tr>
<tr>
<td>n-octanol/water</td>
<td></td>
</tr>
<tr>
<td>Relative vapour density</td>
<td>4.46</td>
</tr>
<tr>
<td></td>
<td>- (Air = 1.0)</td>
</tr>
</tbody>
</table>

10 - Stability and Reactivity

Storage stability
- Stable under recommended storage conditions.

Conditions to avoid
- Heat, flames and sparks.

Materials to avoid
- Strong oxidizing agents, Carbon dioxide (CO2), Zinc, Iron, Copper

Hazardous decomposition products
- Hazardous decomposition products formed under fire conditions. - Carbon oxides, nitrogen oxides (NOx)

11 - Toxicological Information

ACUTE TOXICITY
- LD50 Oral - rat - 189 mg/kg
- LC50 Inhalation - rabbit - 769 mg/kg
- LD50 Dermal - rabbit - 770 mg/kg

Irritation and corrosion
- Skin - rabbit - Open irritation test

Sensitisation
- no data available

Chronic exposure
IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

Genotoxicity in vitro - Hamster - fibroblast
Cytogenetic analysis

Signs and Symptoms of Exposure
Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin. Cough, Shortness of breath, Headache, Nausea

Potential Health Effects

<table>
<thead>
<tr>
<th>Exposure</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inhalation</td>
<td>Harmful if inhaled. May cause respiratory tract irritation.</td>
</tr>
<tr>
<td>Skin</td>
<td>Harmful if absorbed through skin. May cause skin irritation.</td>
</tr>
<tr>
<td>Eyes</td>
<td>May cause eye irritation.</td>
</tr>
<tr>
<td>Ingestion</td>
<td>Harmful if swallowed.</td>
</tr>
<tr>
<td>Target Organs</td>
<td>Eyes,</td>
</tr>
</tbody>
</table>

Additional Information
RTECS: HR7780000

12 - Ecological Information

Elimination information (persistence and degradability)
no data available

Ecotoxicity effects

<table>
<thead>
<tr>
<th>Ecotoxicity to fish</th>
<th>LC50 - Oncorhynchus mykiss (rainbow trout) - 5.5 - 37.0 mg/l - 96 h</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toxicity to daphnia and</td>
<td>Daphnia magna (Water flea) - 66 mg/l - 48 h</td>
</tr>
<tr>
<td>other aquatic Invertebrates.</td>
<td></td>
</tr>
<tr>
<td>Toxicity to algae</td>
<td>EC50 - Pseudokirchneriella subcapitata (green algae) - 19 mg/l - 96 h</td>
</tr>
</tbody>
</table>

Further information on ecology
No data available.

13 - Disposal Considerations

Product
- This combustible material may be burned in a chemical incinerator equipped with an afterburner and scrubber. Observe all federal, state, and local environmental regulations. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging
- Dispose of as unused product.

14 - Transport Information

ADR/RID
UN-Number: 2248
Class: 8(3)
Packing group: II
Proper shipping name: DI-n-BUTYLAMINE

IMDG
UN-Number: 2248
Class: 8(3)
Packing group: II EMS-No: F-E, S-C
Proper shipping name: DI-n-BUTYLAMINE
Marine pollutant: No

IATA
UN-Number: 2248
Class: 8(3)
Packing group: II
Proper shipping name: DI-n-BUTYLAMINE

15 - Regulatory Information
Labelling according to EC Directives
EC Label

<table>
<thead>
<tr>
<th>Hazard symbols</th>
<th>R-phrase(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Xn Harmful</td>
<td>R10 Flammable..</td>
</tr>
<tr>
<td></td>
<td>R20/21/22 Harmful by inhalation, in contact with skin and if swallowed.</td>
</tr>
</tbody>
</table>
1 - IDENTIFICATION OF THE SUBSTANCE

Name                  Ethylenediaminetetraacetic acid

2 - Hazards Identification
Risk advice to man and the environment
   • Irritating to eyes. Harmful to aquatic organisms, may cause long-term adverse
effects in the aquatic environment

3 - Composition/Information on Ingredients

<table>
<thead>
<tr>
<th>Synonyms</th>
<th>Formula</th>
<th>Molecular Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Edathamil</td>
<td>C10H16N2O8</td>
<td>292.24 g/mol</td>
</tr>
<tr>
<td>(Ethylenedinitrilo)tetraacetic acid</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ethylenedinitrilotetraacetic acid</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EDTA</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Reagent</th>
<th>CAS No</th>
<th>EC No</th>
<th>EC-Index No</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethylenediaminetetrametic acid</td>
<td>60-00-4</td>
<td>200-449-4</td>
<td>--</td>
<td>Xi, R36 - R52/53</td>
</tr>
</tbody>
</table>

4 - First Aid Measures

General advice
   • Consult a physician. Show this safety data sheet to the doctor in attendance.

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
   • Rinse thoroughly with plenty of water for at least 15 minutes and consult a
     physician

If swallowed
   • Never give anything by mouth to an unconscious person. Rinse mouth with water.
     Consult a physician.

5 - Fire Fighting Measures

Suitable extinguishing media
   • Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.
Special protective equipment for fire-fighters
• Wear self contained breathing apparatus for fire fighting if necessary.

6 - Accidental Release Measures

Personal precautions
• Use personal protective equipment. Avoid dust formation. Avoid breathing dust. Ensure adequate ventilation.

Environmental precautions
• Do not let product enter drains. Discharge into the environment must be avoided.

Methods for cleaning up
Pick up and arrange disposal without creating dust. Keep in suitable, closed containers for disposal.

7 - Handling and Storage

Handling
• Avoid contact with skin and eyes. Avoid formation of dust and aerosols.
• Provide appropriate exhaust ventilation at places where dust is formed. Normal measures for preventive fire protection.

Storage
• Store in cool place. Keep container tightly closed in a dry and well-ventilated place.

8 - Exposure Controls / Personal Protection

Personal protective equipment
• Respiratory protection: Where risk assessment shows air-purifying respirators are appropriate use a dust mask type N95 (US) or type P1 (EN 143) respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).
• Hand protection: The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it. Handle with gloves.
• Eye protection Safety glasses
• Skin and body protection: Choose body protection according to the amount and concentration of the dangerous substance at the work place.
• 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 white
Safety data

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>2.5 at 10 g/l at 23 °C</td>
</tr>
<tr>
<td>Melting point</td>
<td>250 °C</td>
</tr>
<tr>
<td>Boiling point</td>
<td>no data available</td>
</tr>
<tr>
<td>Flash point</td>
<td>no data available</td>
</tr>
<tr>
<td>Ignition temperature</td>
<td>no data available</td>
</tr>
<tr>
<td>Lower explosion limit</td>
<td>no data available</td>
</tr>
<tr>
<td>Upper explosion limit</td>
<td>no data available</td>
</tr>
<tr>
<td>Density</td>
<td>0.860 g/cm³ at 20 °C</td>
</tr>
<tr>
<td>Water solubility</td>
<td>no data available</td>
</tr>
<tr>
<td>Partition coefficient:</td>
<td>log Pow: -3.34</td>
</tr>
<tr>
<td>n-octanol/water</td>
<td></td>
</tr>
</tbody>
</table>

**10 - Stability and Reactivity**

Storage stability
- Stable under recommended storage conditions.

Conditions to avoid
- Strong oxidizing agents

Hazardous decomposition products
- Hazardous decomposition products formed under fire conditions. - Carbon oxides, nitrogen oxides (NOx)

**11 - Toxicological Information**

**ACUTE TOXICITY**
- LD50 Oral - rat - 2.580 mg/kg

Irritation and corrosion
- Eyes - rabbit - Eye irritation

Sensitisation
- Will not occur

Chronic exposure
- IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

Signs and Symptoms of Exposure
- To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.
Potential Health Effects

<table>
<thead>
<tr>
<th>Exposure Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inhalation</td>
<td>May be harmful if inhaled. May cause respiratory tract irritation.</td>
</tr>
<tr>
<td>Skin</td>
<td>May be harmful if absorbed through skin. May cause skin irritation.</td>
</tr>
<tr>
<td>Eyes</td>
<td>Causes eye irritation.</td>
</tr>
<tr>
<td>Ingestion</td>
<td>May be harmful if swallowed.</td>
</tr>
</tbody>
</table>

Additional Information
RTECS: AH4025000

12 - Ecological Information

Elimination information (persistence and degradability)
- Bioaccumulation: Lepomis macrochirus - 28 d
  - Bioconcentration factor (BCF): 1.8

Ecotoxicity effects

<table>
<thead>
<tr>
<th>Ecotoxicity Type</th>
<th>Effect Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toxicity to fish</td>
<td>mortality NOEC - Lepomis macrochirus - 24 mg/l - 96 h</td>
</tr>
<tr>
<td></td>
<td>LC50 - Lepomis macrochirus (Bluegill) - 34 - 62 mg/l - 96 h</td>
</tr>
<tr>
<td>Toxicity to daphnia and other aquatic invertebrates</td>
<td>EC50 - Daphnia magna (Water flea) - 113 mg/l - 48 h</td>
</tr>
</tbody>
</table>

Further information on ecology
Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment. May be harmful to aquatic organisms due to the shift of the pH. Avoid release to the environment.

13 - Disposal Considerations

Product
- Observe all federal, state, and local environmental regulations. 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 hemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging
- Dispose of as unused product.

14 - Transport Information

- ADR/RID: Not dangerous goods
- IMDG: Not dangerous goods
- IATA: Not dangerous goods
## 15 - Regulatory Information

Labelling according to EC Directives

<table>
<thead>
<tr>
<th>Hazard symbols</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Xi</td>
<td>Irritant</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>R-phrase(s)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>R36</td>
<td>Irritating to eyes.</td>
</tr>
<tr>
<td>R52/53</td>
<td>Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>S-phrase(s)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>S26</td>
<td>In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.</td>
</tr>
<tr>
<td>S61</td>
<td>Avoid release to the environment. Refer to special instructions/ Safety data sheets.</td>
</tr>
</tbody>
</table>
1 - IDENTIFICATION OF THE SUBSTANCE

Name                      Sodium hydroxide

2 - Hazards Identification

Causes severe burns.

3 - Composition/Information on Ingredients

Formula :                  NaOH
Molecular Weight :          40 g/mol

<table>
<thead>
<tr>
<th>Reagent</th>
<th>CAS No</th>
<th>EC No</th>
<th>EC-Index No</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium hydroxide</td>
<td>1310-73-2</td>
<td>215-185-5</td>
<td>011-002-00-6</td>
<td>C, R35</td>
</tr>
</tbody>
</table>

4 - First Aid Measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.

If inhaled
- If breathed in, move person into fresh air. If not breathing give artificial respiration
  Consult a physician.

In case of eye contact
- Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed
- Do NOT induce vomiting. Never give anything by mouth to an unconscious person.
  Rinse mouth with water. Consult a physician.

5 - Fire Fighting Measures

Suitable extinguishing media
- Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Special protective equipment for fire-fighters
- Wear self contained breathing apparatus for fire fighting if necessary.

Further information
- The product itself does not burn.
6 - Accidental Release Measures

Personal precautions
- Use personal protective equipment. Avoid dust formation. Avoid breathing dust. Ensure adequate ventilation. Evacuate personnel to safe areas.

Environmental precautions
- Do not let product enter drains.

Methods for cleaning up
- Pick up and arrange disposal without creating dust. Keep in suitable, closed containers for disposal.

7 - Handling and Storage

Handling
- Avoid formation of dust and aerosols.
- Provide appropriate exhaust ventilation at places where dust is formed.

Storage
- Store in cool place. Keep container tightly closed in a dry and well-ventilated place.

8 - Exposure Controls / Personal Protection

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: The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it. Handle with gloves.
- Eye protection: Safety glasses
- Skin and body protection: Choose body protection according to the amount and concentration of the dangerous substance at the work place.
- 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 pellets Colour white
Safety data

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>13.0 - 14</td>
</tr>
<tr>
<td>Melting point</td>
<td>318 °C</td>
</tr>
<tr>
<td>Boiling point</td>
<td>1.390 °C</td>
</tr>
<tr>
<td>Flash point</td>
<td>not applicable</td>
</tr>
<tr>
<td>Ignition temperature</td>
<td>no data available</td>
</tr>
<tr>
<td>Lower explosion limit</td>
<td>no data available</td>
</tr>
<tr>
<td>Upper explosion limit</td>
<td>no data available</td>
</tr>
<tr>
<td>Vapour pressure</td>
<td>&lt; 24.00 hPa at 20 °C</td>
</tr>
<tr>
<td></td>
<td>4.00 hPa at 37 °C</td>
</tr>
<tr>
<td>Density</td>
<td>2.1300 g/cm³</td>
</tr>
<tr>
<td>Water solubility</td>
<td>no data available</td>
</tr>
</tbody>
</table>

10 - Stability and Reactivity

Storage stability
- Stable under recommended storage conditions.

Materials to avoid
- Strong oxidizing agents, Strong acids, Organic materials

Hazardous decomposition products
- Hazardous decomposition products formed under fire conditions. - Sodium/sodium oxides

11 - Toxicological Information

ACUTE TOXICITY
- no data available

Irritation and corrosion
- Skin - rabbit - Severe skin irritation - 24 h
- Eyes - rabbit - Severe eye irritation - 24 h

Sensitisation
- no data available

Chronic exposure
- IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

Signs and Symptoms of Exposure
- spasm, inflammation and edema of the larynx, spasm, inflammation and edema of the bronchi, pneumonitis, pulmonary edema, burning sensation, Cough, wheezing, laryngitis, Shortness of breath, Headache, Nausea, Vomiting, Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin.
Potential Health Effects

<table>
<thead>
<tr>
<th>Route</th>
<th>Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inhalation</td>
<td>May be harmful if inhaled. Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract.</td>
</tr>
<tr>
<td>Skin</td>
<td>May be harmful if absorbed through skin. Causes severe skin burns.</td>
</tr>
<tr>
<td>Eyes</td>
<td>Causes severe eye burns.</td>
</tr>
<tr>
<td>Ingestion</td>
<td>May be harmful if swallowed. Causes severe burns.</td>
</tr>
</tbody>
</table>

Additional Information
RTECS: WB4900000

12 - Ecological Information

Elimination information (persistence and degradability)
no data available

Ecotoxicity effects

<table>
<thead>
<tr>
<th>Toxicity</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fish</td>
<td>LC50 - Gambusia affinis (Mosquito fish) - 125 mg/l - 96 h</td>
</tr>
<tr>
<td>Daphnia and other aquatic Invertebrates</td>
<td>Immobilization EC50 - Daphnia - 40.38 mg/l - 48 h</td>
</tr>
</tbody>
</table>

Further information on ecology
No data available.

13 - Disposal Considerations

Product
- Observe all federal, state, and local environmental regulations. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging
- Dispose of as unused product.

14 - Transport Information

ADR/RID
UN-Number: 1823
Class: 8
Packing group: II
Proper shipping name: SODIUM HYDROXIDE, SOLID

IMDG
UN-Number: 1823
Class: 8
Packing group: II EMS-No: F-A, S-B
Proper shipping name: SODIUM HYDROXIDE, SOLID
Marine pollutant: No

IATA
UN-Number: 1823
Class: 8
Packing group: II
Proper shipping name: Sodium hydroxide, solid

15 - Regulatory Information

Labelling according to EC Directives
EC Label

Hazard symbols

<table>
<thead>
<tr>
<th>Corrosive</th>
</tr>
</thead>
</table>

R-phrase(s)

<table>
<thead>
<tr>
<th>R35</th>
<th>Causes severe burns.</th>
</tr>
</thead>
</table>

S-phrase(s)

<table>
<thead>
<tr>
<th>S26</th>
<th>In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.</th>
</tr>
</thead>
<tbody>
<tr>
<td>S37/39</td>
<td>Wear suitable gloves and eye/face protection.</td>
</tr>
<tr>
<td>S45</td>
<td>In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).</td>
</tr>
</tbody>
</table>