Section 1 - Product and Company Information

Product Name: 4-NITROANILINE, 98%
Product Number: 45685
Brand: Aldrich Chemical
Company: Sigma-Aldrich
Street Address: 3505 Supe Street
City, State, Zip, Country: SAINT LOUIS, MO 63103 US
Technical Phone: 314 777-5663
Fax: 800 323 5005
Emergency Phone: 414 273 3500 Ext. 5996

Section 2 - Composition/Information on Ingredient

 Substance Name: 4-NITROANILINE
CAS #: 100-01-6
SARA 313: Yes

Formula: C8H7N2O2

Section 3 - Hazards Identification

Emergency Overview
Toxic: Toxic by inhalation, contact with skin and if swallowed. Danger of cumulative effects. Initiating to eyes, respiratory system and skin. Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
Target organ(s): Blood. Causes cyanosis. Rapidly absorbed through skin.

HMIS Rating
Health: 2
Flammability: 0
Reactivity: 1

NFPA Rating
Health: 2
Flammability: 0
Reactivity: 1

No additional chronic hazards present.
For additional information on toxicity, please refer to Section 11.

Section 4 - First Aid Measures

Oral Exposure
If swallowed, wash out mouth with water provided person is conscious. Call a physician immediately.

Section 5 - Fire Fighting Measures

Flash Point: 415.4 °F
Autoignition Temp: 213 °C

Firefighting
Protective Equipment
Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

Specific Hazard(s)
Emits toxic fumes under fire conditions.

Section 6 - Accidental Release Measures

Procedure to be Followed in Case of Leak or Spill
Evacuate area.

Procedure(s) of Personal Protection(s)
Wear self-contained breathing apparatus, rubber boots, and heavy rubber gloves.

Methods for Cleaning Up
Sweep up, place in a bag and hold for waste disposal. Avoid breathing dust. Ventilate area and wash spill site after material pickup is complete.

Section 7 - Handling and Storage

Handling
User Exposure
Do not breathe dust. Do not get in eyes, on skin, or clothing. Avoid prolonging or repeated exposure.

Storage
Suitable
Keep tightly closed.

Special Requirements
Moisture sensitive.

Section 8 - Exposure Controls / PPE

Engineering Controls
Use only in a chemical fume hood. Safety shower and eyewash required.

Personal Protective Equipment
Respiratory
Government approved respirator.

Hand
Compatible chemical-resistant gloves.

Eye
Chemical safety goggles.

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General Hygiene Measures
Wash contaminated clothing before reuse. Wash thoroughly after handling.

Exposure Limits

<table>
<thead>
<tr>
<th>Country</th>
<th>Type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poland</td>
<td>NDS</td>
<td>3 WU/M3</td>
</tr>
<tr>
<td>Poland</td>
<td>NDSc</td>
<td>10 M3/M3</td>
</tr>
<tr>
<td>Poland</td>
<td>NDSp</td>
<td></td>
</tr>
</tbody>
</table>

Exposure Limits, RTECS

<table>
<thead>
<tr>
<th>Country</th>
<th>Source</th>
<th>Type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>AGSH</td>
<td>TWA</td>
<td>3 MG/M3</td>
</tr>
<tr>
<td>USA</td>
<td>MSHA Standard-air</td>
<td>TWA</td>
<td>1 PPM (5 MG/M3 (SKIN))</td>
</tr>
<tr>
<td>USA</td>
<td>OSHA</td>
<td>PEL</td>
<td>8H-TWA 1 PPM (6 MG/M3 (SKIN))</td>
</tr>
<tr>
<td>New Zealand</td>
<td>OEL</td>
<td>TWA</td>
<td>3 MG/M3 (SKIN)</td>
</tr>
</tbody>
</table>

Section 9 - Physical/Chemical Properties

<table>
<thead>
<tr>
<th>Appearance</th>
<th>Color</th>
<th>Form</th>
<th>Odor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Molecular Weight: 136.13 AMU</td>
<td>Yellow</td>
<td>Fine crystals</td>
<td>Ammonia odor</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>6.7</td>
</tr>
<tr>
<td>BP/VP Range</td>
<td>260 °C / 100 mmHg</td>
</tr>
<tr>
<td>MP/MP Range</td>
<td>146 °C</td>
</tr>
<tr>
<td>Freezing Point</td>
<td>N/A</td>
</tr>
<tr>
<td>Vapor Pressure</td>
<td>0.004 mmHg</td>
</tr>
<tr>
<td>Vapor Density</td>
<td>4.77 g/l</td>
</tr>
<tr>
<td>Saturated Vapor Conc.</td>
<td>N/A</td>
</tr>
<tr>
<td>SG/Density</td>
<td>1.44 g/cm3</td>
</tr>
<tr>
<td>Bulk Density</td>
<td>650 kg/m3</td>
</tr>
<tr>
<td>Odor Threshold</td>
<td>N/A</td>
</tr>
<tr>
<td>Volatility</td>
<td>N/A</td>
</tr>
<tr>
<td>VOC Content</td>
<td>N/A</td>
</tr>
<tr>
<td>Water Content</td>
<td>N/A</td>
</tr>
<tr>
<td>Solvent Content</td>
<td>N/A</td>
</tr>
<tr>
<td>Evaporation Rate</td>
<td>N/A</td>
</tr>
<tr>
<td>Viscosity</td>
<td>N/A</td>
</tr>
<tr>
<td>Partition Coefficient Log Kow</td>
<td>1.39</td>
</tr>
<tr>
<td>Decomposition Temp.</td>
<td>N/A</td>
</tr>
<tr>
<td>Flash Point - °F</td>
<td>415.4 °F</td>
</tr>
<tr>
<td>Flash Point - °C</td>
<td>213 °C</td>
</tr>
<tr>
<td>Explosion Limits</td>
<td>N/A</td>
</tr>
<tr>
<td>Flammability</td>
<td>N/A</td>
</tr>
<tr>
<td>Autoignition Temp</td>
<td>180 °C</td>
</tr>
</tbody>
</table>

Solubility

Solubility in Water: Slightly.

Section 10 - Stability and Reactivity

Stability

Stable.

Conditions to Avoid

Sensitive to moisture. This product generates heat as it absorbs moisture or water.

Materials to Avoid

Strong acids, strong oxidizing agents, strong reducing agents, Plastics, Rubber.

Hazardous Decomposition Products

Hazardous Decomposition Products

Thermal decomposition may produce carbon monoxide, carbon dioxide, and nitrogen oxides.

Hazardous Polymerization

Hazardous Polymerization

Will not occur.

Section 11 - Toxicological Information

Route of Exposure

<table>
<thead>
<tr>
<th>Skin Contact</th>
<th>Causes skin irritation.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skin Absorption</td>
<td>Toxic if absorbed through skin. Readily absorbed through skin.</td>
</tr>
<tr>
<td>Eye Contact</td>
<td>Causes eye irritation.</td>
</tr>
<tr>
<td>Inhalation</td>
<td>Toxic if inhaled. Material is irritating to mucous membranes and upper respiratory tract.</td>
</tr>
<tr>
<td>Ingestion</td>
<td>Toxic if swallowed.</td>
</tr>
</tbody>
</table>

Target Organ(e) or System(s)

Blood; Heart; Lungs; Liver.

Signs and Symptoms of Exposure

Absorption into the body leads to the formation of methemoglobin which in sufficient concentration causes cyanosis. Onset may be delayed 2 to 4 hours of longer. Exposure to and/or consumption of alcohol may increase toxic effects. Exposure can cause: Headache, Unconsciousness, Coughing, chest pains, difficulty in breathing, Drowsiness, Nausea, Cyanosis, Ataxia, Diaphoresis, Vomiting. To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated. p-Nitroaniline is readily absorbed by inhalation, ingestion, or skin absorption. It is a strong methemoglobin former. Cyanosis is the first manifestation of toxicity.

RTECS Number: BY7000000

Toxicity Data

Oral - Rat: 750 mg/kg (LD50)
Oral - Mouse: 810 mg/kg (LD50)
Intraperitoneal - Mouse: 250 M3/KG (LD50)
Intramuscular - Mouse: 800 M3/KG (LD50)
Oral - Guinea pig: 650 mg/kg (LD50)
Remarks: Behavioral/Behavioral effects on or before seizure threshold.
Skin - Guinea pig: > 500 mg/kg (LD50)
Oral - Qual: 1,000 mg/kg (LD50)
Oral - Bird (wld): 75 mg/kg (LD50)

Chronic Exposure Carcinogen
- Mouse - Oral: 5,150 mg/KG 2Y 1
- Result: Tumorigenic/Equivocal tumorigenic agent by RTECS criteria. Vascular Tumors.

NTP Carcinogen List
- Species: Mouse
- Route: Gavage

ACGIH Carcinogen List
- Route: A4

Chronic Exposure - Mutagen
- Species: Mouse
- Route: Oral
- Result: Effects on Fertility: Female fertility index (e.g., # females pregnant per # animals); # females pregnant per # females mated.
- Route of Application: Oral
- Exposure Time: (6-13D PREC)
- Species: Daphnia magna
- Time: 148.0 h
- Test Type: LC50 Fish
- Species: Pimephales promelas (Fathead minnow)
- Time: 96.0 h
- Test Type: LC50 Fish
- Species: Leuciscus idus
- Time: 48.0 h

Section 12 - Ecological Information

Acute Ecotoxicity Tests
- Test Type: EC50 Algae
- Time: 24.0 h
- Value: 68 mg/l
- Test Type: EC50 Daphnia
- Species: Daphnia magna
- Time: 48.0 h
- Value: 17 mg/l

EU Directives Classification
- Symbol of Danger: T T
- Indication of Danger
- Toxic. Use with Caution.
- Risk Statements: R: 23/24/25 33 35/36 37 38/39
- Toxic by inhalation, in contact with skin and if swallowed. Avoid contact with skin and eyes. Use appropriate protective clothing, including gloves, and a respirator with a P2 filter. Use appropriate personal protective equipment when handling the chemical. Do not breathe the dust, fumes or gas. Avoid contact with skin, eyes and clothing. Avoid contact with foodstuffs, water and soil. Do not swallow. Avoid contact with skin and eyes. Avoid contact with clothing. Avoid contact with foodstuffs, water and soil. Keep well ventilated. Keep well away from heat, flame and sources of ignition. Do not immerse in water.
- Safety Statements: S: 26 28 36/37 39 45
- After contact with skin, wash immediately with plenty of soap and water. Wear suitable protective clothing and gloves. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). Avoid release to the environment.

United States Regulatory Information
- SARA Listed: Yes
- Demineralized: 1 %
- Notes: This product is subject to SARA section 313 reporting requirements.
- TSCA Inventory Item: Yes

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Section 16 - Other Information

Disclaimer
For R&D use only. Not for drug, household or other uses.

Warranty
The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. Sigma-Aldrich Inc., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale. Copyright 2003 Sigma-Aldrich Co. License granted to make unlimited paper copies for internal use only.