IDENTIFICATION

MSDS Record Number: 5618328
Product Name(s): Piperidine
Product Identification: MSDS NUMBER: P4776
                  PRODUCT CODE: 2895
                  C.A.S. NUMBER: 110-89-4
Date of MSDS: 2007-07-20
Currency Note: This MSDS was acquired from the supplier on 2007-09-06.

MANUFACTURER/SUPPLIER INFORMATION

Company: MALLINCKRODT BAKER INC

MATERIAL SAFETY DATA

Effective Date: 07/20/07
Supercedes: 05/07/07

MATERIAL SAFETY DATA SHEET
From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865
Emergency Telephone Number: 908-859-2151

J. T. BAKER

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CHEMTREC: 800-424-9300 (USA)
          703-527-3887 (Outside USA & CANADA)
CANUTEC:  613-996-6666

NOTE: Use CHEMTREC and CANUTEC phone numbers only in the event of a chemical emergency.

1. Product Identification

   Synonyms: Hexahydropyridine; Pentamethyleneimine;
              Azacyclohexane
   CAS No.: 110-89-4
   Molecular Weight: 85.15
   Chemical Formula: C5H11N
2. Composition/Information on Ingredients

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>CAS No</th>
<th>Percent</th>
<th>Hazardous</th>
</tr>
</thead>
<tbody>
<tr>
<td>Piperidine</td>
<td>110-89-4</td>
<td>99 - 100%</td>
<td>Yes</td>
</tr>
</tbody>
</table>

3. Hazards Identification

Emergency Overview

DANGER! FLAMMABLE LIQUID AND VAPOR. HARMFUL IF SWALLOWED, INHALED OR ABSORBED THROUGH SKIN. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. MAY CAUSE BURNS TO SKIN AND EYES. AFFECTS CENTRAL NERVOUS SYSTEM.

SAF-T-DATA(tm) Ratings (Provided here for your convenience)

<table>
<thead>
<tr>
<th>Health Rating</th>
<th></th>
<th>Flammability Rating</th>
<th></th>
<th>Reactivity Rating</th>
<th></th>
<th>Contact Rating</th>
<th></th>
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<tbody>
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</tbody>
</table>

Health Rating: 3 - Severe
Flammability Rating: 3 - Severe (Flammable)
Reactivity Rating: 1 - Slight
Contact Rating: 4 - Extreme (Corrosive)

Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES; CLASS B EXTINGUISHER

Storage Color Code: Red (Flammable)

Potential Health Effects

Inhalation:
May cause severe irritation of the respiratory tract with sore throat, coughing, shortness of breath and delayed lung edema. Causes chemical burns to the respiratory tract.

Ingestion:
Harmful if swallowed. May produce severe irritation of the mouth and gastrointestinal tract. Can cause nervous system damage. May cause tremors and convulsions.

Skin Contact:
Harmful if absorbed through the skin. Penetration may continue for several days. Causes skin irritation and possible severe skin irritation especially if the skin is wet or moist.

Eye Contact:
Vapors cause irritation to the eyes with redness, pain, and blurred vision. Higher concentrations or splashes may cause irreversible eye damage.

Chronic Exposure:
Repeated inhalation may cause chronic bronchitis. Prolonged or repeated contact may cause skin necrosis and/or ulceration of the skin. May cause chronic cough.

Aggravation of Pre-existing Conditions:
No information found.

4. First Aid Measures
Inhalation:
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:
If swallowed, get immediate medical attention. DO NOT INDUCE VOMITING!
Give several glasses of milk or water. Never give anything by mouth to an unconscious person.

Skin Contact:
Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention immediately. Wash clothing before reuse. Thoroughly clean shoes before reuse.

Eye Contact:
Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

5. Fire Fighting Measures

Fire:
Flash point: 16C (61F) CC
Autoignition temperature: 320C (608F)
Flammable liquid and vapor.
Maybe ignited by heat, sparks, flames.
Fire may produce irritating or poisonous gases.

Explosion:
Above the flash point, explosive vapor-air mixtures may be formed. Vapors may flow along surfaces to distant ignition sources and flash back. Closed containers exposed to heat may explode. Contact with strong oxidizers may cause fire.

Fire Extinguishing Media:
Use alcohol foam, dry chemical or carbon dioxide. (Water may be ineffective.)

Special Information:
Firefighters should wear proper protective equipment and self-contained breathing apparatus with full facepiece operated in positive pressure mode. Move exposed containers from fire area if it can be done without risk. Use water to keep fire-exposed containers cool.

6. Accidental Release Measures

Ventilate area of leak or spill. Remove all sources of ignition. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Use non-sparking tools and equipment. Collect liquid in an appropriate container or absorb with an inert material (e.g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer!
J. T. Baker SOLUSORB(R) solvent adsorbent is recommended for spills of this product.
7. Handling and Storage

Protect against physical damage. Outside or detached storage is preferred. Inside storage should be in a standard flammable liquids storage room or cabinet. Separate from oxidizing materials. Storage and use areas should be No Smoking areas. Bond and ground containers when transferring liquid. Empty containers may contain toxic, flammable/combustible or explosive residue or vapors. Do not cut, grind, drill, weld, reuse or dispose of containers unless adequate precautions are taken against these hazards. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:
AIHA Workplace Environmental Exposure Level (WEEL):
1.0 ppm 8 hour (TWA) (3.5 mg/m3), skin contact can invalidate TWA

Ventilation System:
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, "Industrial Ventilation, A Manual of Recommended Practices", most recent edition, for details.

Personal Respirators (NIOSH Approved):
If the exposure limit is exceeded and engineering controls are not feasible, wear a supplied air, full-facepiece respirator, airlined hood, or full-facepiece self-contained breathing apparatus. Breathing air quality must meet the requirements of the OSHA respiratory protection standard (29CFR1910.134).

Skin Protection:
Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

Eye Protection:
Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

9. Physical and Chemical Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Colorless liquid.</td>
</tr>
<tr>
<td>Odor</td>
<td>Odor of pepper.</td>
</tr>
<tr>
<td>Solubility</td>
<td>Complete (100%)</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>0.86</td>
</tr>
<tr>
<td>pH</td>
<td>Strong base</td>
</tr>
<tr>
<td>Boiling Point</td>
<td>106°C (223°F)</td>
</tr>
<tr>
<td>Melting Point</td>
<td>-13°C (9°F)</td>
</tr>
<tr>
<td>Vapor Density (Air=1)</td>
<td>3.0</td>
</tr>
<tr>
<td>Vapor Pressure (mm Hg)</td>
<td>40 @ 29.9°C (85°F)</td>
</tr>
<tr>
<td>Evaporation Rate (BuAc=1)</td>
<td>No information found.</td>
</tr>
</tbody>
</table>
10. Stability and Reactivity

Stability:
Stable under ordinary conditions of use and storage.

Hazardous Decomposition Products:
Oxides of nitrogen, carbon monoxide, carbon dioxide.

Hazardous Polymerization:
Will not occur.

Incompatibilities:
Strong oxidizing agents, water, strong acids, organic acids.

Conditions to Avoid:
Heat, flame, other sources of ignition.

11. Toxicological Information

Piperidine: Oral rat LD50: 400 mg/kg; skin rabbit LD50: 320 mg/kg.
Investigated as a mutagen, reproductive effector.

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>NTP Carcinogen</th>
</tr>
</thead>
<tbody>
<tr>
<td>Piperidine (110-89-4)</td>
<td>No</td>
</tr>
</tbody>
</table>

12. Ecological Information

Environmental Fate:
No information found.

Environmental Toxicity:
No information found.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations.

Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Domestic (Land, D.O.T.)

Proper Shipping Name: PIPERIDINE
Hazard Class: 8, 3
15. Regulatory Information

\---------------\Chemical Inventory Status - Part 1\---------------

Ingredient: Piperidine (110-89-4)
TSCA: Yes Yes Yes Yes
BE: Yes Yes Yes Yes
Japan: Yes Yes Yes Yes
Australia: Yes Yes Yes Yes

\---------------\Chemical Inventory Status - Part 2\---------------

Ingredient: Piperidine (110-89-4)
Korea: Yes No No Yes
DSL: No No Yes Yes
NDL: No No Yes Yes
Philippines: No No Yes Yes

\---------------\Federal, State & International Regulations - Part 1\---------------

Ingredient: Piperidine (110-89-4)
SARA 302: Yes Yes Yes Yes
SARA 313: Yes Yes Yes Yes

\---------------\Federal, State & International Regulations - Part 2\---------------

Ingredient: Piperidine (110-89-4)
CERCLA: 1000 1000 No No
SARA 311/312: Acute: Yes Chronic: No Fire: Yes Pressure: No
Reactivity: No (Pure / Liquid)

Chemical Weapons Convention: No TSCA 12(b): No CDTA: Yes
SARA 311/312: Acute: Yes Chronic: No Fire: Yes Pressure: No
Reactivity: No (Pure / Liquid)

Australian Hazchem Code: 2WE
Australian Poison Schedule: None allocated.

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This MSDS has been prepared according to the hazard
criteria of the Controlled Products Regulations (CPR) and
the MSDS contains all of the information required by the
CPR.

16. Other Information

NFPA Ratings:
Health: 3 Flammability: 3 Reactivity: 0

Label Hazard Warning:
DANGER! FLAMMABLE LIQUID AND VAPOR. HARMFUL IF SWALLOWED, INHALED OR
ABSORBED THROUGH SKIN. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY
TRACT. MAY CAUSE BURNS TO SKIN AND EYES. AFFECTS CENTRAL NERVOUS SYSTEM.

Label Precautions:
Keep away from heat, sparks and flame.
Keep container closed.
Use only with adequate ventilation.
Avoid breathing vapor.
Avoid contact with eyes, skin and clothing.
Wash thoroughly after handling.

Label First Aid:
If swallowed, get immediate medical attention. DO NOT INDUCE VOMITING!
Give several glasses of milk or water. Never give anything by mouth to an
unconscious person. If inhaled, remove to fresh air. If not breathing,
give artificial respiration. If breathing is difficult, give oxygen. In
case of contact, immediately flush eyes or skin with plenty of water for
at least 15 minutes. Remove contaminated clothing and shoes. Wash
clothing before reuse. In all cases, get medical attention.

Product Use:
Laboratory Reagent.

Revision Information:
MSDS Section(s) changed since last revision of document include: 3.

Disclaimer:
********************************************************************************
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P4776

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