SAFETY DATA SHEET

Product code: P1146
Product Name: PIPERIDINE, REAGENT

Other means of identification
Synonyms:
Azacyclohexane
Pentamethyleneimine
Pentamethylenimine
Piperidin (German)
Cyclopentimine
Cypentil
Hexahydropyridine
Hexazane
Pyridine, hexahydro

CAS #: 110-89-4
RTECS #: TM3500000
CI#: Not available

Recommended use of the chemical and restrictions on use
Recommended use: No information available.
Uses advised against: No information available

Supplier:
Spectrum Chemicals and Laboratory Products, Inc.
14422 South San Pedro St.
Gardena, CA 90248
(310) 516-8000
Order Online At:
https://www.spectrumchemical.com

Emergency telephone number
Chemtrec 1-800-424-9300
Contact Person:
Martin LaBenz (West Coast)
Ibad Tirmiz (East Coast)

2. HAZARDS IDENTIFICATION

Classification
This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

| Acute toxicity - Oral | Category 2 |
| Acute toxicity - Dermal | Category 3 |
| Acute toxicity - Inhalation (Gases) | Category 3 |
| Acute toxicity - Inhalation (Vapors) | Category 3 |
| Acute toxicity - Inhalation (Dusts/Mists) | Category 3 |
| Skin corrosion/irritation | Category 1 |
| Serious eye damage/eye irritation | Category 1 |
**Label elements**

**Danger**

**Hazard statements**
- Fatal if swallowed
- Toxic in contact with skin
- Toxic if inhaled
- Causes severe skin burns and eye damage
- Highly flammable liquid and vapor

**Precautionary Statements - Prevention**
- Wash face, hands and any exposed skin thoroughly after handling
- Do not eat, drink or smoke when using this product
- Use only outdoors or in a well-ventilated area
- Do not breathe dust/fume/gas/mist/vapors/spray
- Wear protective gloves/protective clothing/eye protection/face protection
- Keep away from heat/sparks/open flames/hot surfaces. — No smoking
- Keep container tightly closed
- Ground/bond container and receiving equipment
- Use explosion-proof electrical/ventilating/lighting/equipment
- Use only non-sparking tools
- Take precautionary measures against static discharge
- Keep cool

**Precautionary Statements - Response**
- Specific treatment (see .? on this label)
- Immediately call a POISON CENTER or doctor/physician
- Specific treatment (see .? on this label)
- In case of fire: Use CO2, dry chemical, or foam to extinguish.
- IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- Immediately call a POISON CENTER or doctor/physician.

**Hazards not otherwise classified (HNOC)**
- Not Applicable

**Other hazards**
- Can react vigorously with oxidizing materials

**Product code**: P1146

**Product name**: PIPERIDINE, REAGENT
IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower
Wash contaminated clothing before reuse
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER or doctor/physician.
IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician
Rinse mouth
Do NOT induce vomiting

Precautionary Statements - Storage
Store locked up
Store in a well-ventilated place. Keep container tightly closed

Precautionary Statements - Disposal
Dispose of contents/container to an approved waste disposal plant

3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Weight %</th>
<th>Trade Secret</th>
</tr>
</thead>
<tbody>
<tr>
<td>Piperidine</td>
<td>110-89-4</td>
<td>100</td>
<td>*</td>
</tr>
</tbody>
</table>

4. FIRST AID MEASURES

First aid measures

General Advice: Poison information centers in each State capital city can provide additional assistance for scheduled poisons (13 1126). Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.

Skin Contact: Wash off immediately with soap and plenty of water removing all contaminated clothes and shoes. Wash contaminated clothing before re-use. Get medical attention immediately. Call a physician immediately.

Eye Contact: Flush eye with water for 15 minutes. Immediate medical attention is required. Call a physician immediately.

Inhalation: Move to fresh air in case of accidental inhalation of vapours or decomposition products. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician or Poison Control Centre immediately.

Ingestion: Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. Immediate medical attention is required. Call a physician immediately.

Most important symptoms and effects, both acute and delayed

Symptoms: Severe skin and eye irritation or burns. Toxic by inhalation and in contact with skin. Fatal if swallowed.

Indication of any immediate medical attention and special treatment needed
Notes to Physician: Treat symptomatically

Protection of first-aiders
First-Aid Providers: Avoid exposure to blood or body fluids. Wear gloves and other necessary protective clothing. Dispose of contaminated clothing and equipment as bio-hazardous waste

5. FIRE-FIGHTING MEASURES

Extinguishing Media

Suitable Extinguishing Media: Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Product code: P1146
Product name: PIPERIDINE, REAGENT
Unsuitable Extinguishing Media: Do not use a solid (straight) water stream as it may scatter and spread fire.

Specific hazards arising from the chemical

Hazardous Combustion Products: Carbon oxides
Specific hazards: Extremely flammable
Containers may explode when heated
Vapors may form explosive mixtures with air
Vapors may travel to source of ignition and flash back
In combustion, may emit toxic fumes

Special Protective Actions for Firefighters

Specific Methods: No information available.
Special Protective Equipment for Firefighters: As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal Precautions: Ensure adequate ventilation. Use personal protective equipment. Keep people away from and upwind of spill/leak. Remove all sources of ignition. Take precautionary measures against static discharges. Avoid contact with skin, eyes and clothing. Use spark-proof tools and explosion-proof equipment. Pay attention to flashback.

Environmental precautions Do not let product enter drains. Prevent further leakage or spillage if safe to do so. Prevent entry into waterways, sewers, basements or confined areas.

Methods and material for containment and cleaning up

Methods for containment Absorb spill with inert material (e.g. vermiculite, dry sand or earth), then place in a suitable chemical waste container. Keep in suitable, closed containers for disposal.

Methods for cleaning up Use appropriate tools to put the spilled material in a suitable chemical waste disposal container.

7. HANDLING AND STORAGE

Precautions for safe handling

Technical Measures/Precautions: Provide sufficient air exchange and/or exhaust in work rooms. Remove all sources of ignition. Keep away from incompatible materials. To avoid ignition of vapors by static electricity discharge, all metal parts of the equipment must be grounded.

Safe Handling Advice: Avoid contact with skin, eyes and clothing. Do not breathe vapors or spray mist. Do not smoke. Handle in accordance with good industrial hygiene and safety practice. Keep away from heat and sources of ignition. May form explosive mixtures in presence of oxidising substances (gas/dust). Wear personal protective equipment. Use only in well-ventilated areas. Vapours may form explosive mixtures with air.

Conditions for safe storage, including any incompatibilities
Technical Measures / Storage Conditions:
Keep containers tightly closed in a dry, cool and well-ventilated place. Store at room temperature in the original container. Store away from incompatible materials. Store in a segregated and approved area.

Incompatible Materials:

### 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

#### Control parameters

#### National occupational exposure limits

<table>
<thead>
<tr>
<th>United States</th>
<th>OSHA</th>
<th>NIOSH</th>
<th>ACGIH</th>
<th>AIHA WHEEL</th>
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<table>
<thead>
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<th></th>
<th>1 ppm TWA</th>
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</thead>
</table>

#### Appropriate engineering controls

**Engineering measures to reduce exposure:** Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors and mist below their respective threshold limit value.

#### Individual protection measures, such as personal protective equipment

**Personal Protective Equipment**

- **Eye protection:** Goggles.
- **Skin and body protection:** Chemical resistant protective suit. Gloves.
- **Respiratory protection:** Vapor respirator. Be sure to use an approved/certified respirator or equivalent.
- **Hygiene measures:** Avoid contact with skin, eyes and clothing. When using, do not eat, drink or smoke. Wash hands before breaks and immediately after handling the product.

### 9. PHYSICAL AND CHEMICAL PROPERTIES
9. PHYSICAL AND CHEMICAL PROPERTIES

**Physical state:** Liquid

**Odor:** Amine-like. Sweetish. Floral.

**Formula:** C5H11N

**Flash Point Tested according to:** Closed cup

**Autoignition Temperature (°C/°F):** No information available

**Boiling point/range(°C/°F):** 106°C/223°F

**Specific gravity:** 0.8622

**Evaporation rate:** No information available

**Odor threshold (ppm):** No information available

**Miscibility:** No information available

**Solubility:** Easily soluble in cold water
Soluble in Methanol
Soluble in diethyl ether
Soluble in Acetone
Soluble in Alcohol
Soluble in Benzene
Soluble in Chloroform

**Physical state:** Liquid

**Taste**

**Flash point (°C):** 16°C

**Lower Explosion Limit (%):** No information available

**pH:** No information available

**Decomposition temperature(°C/°F):** No information available

**Vapor pressure @ 20°C (kPa):** 5.3

**Vapor density:** 3.0

**Partition coefficient (n-octanol/water):** 0.84

**Miscibility:** No information available

10. STABILITY AND REACTIVITY

**Reactivity**
Reactive with oxidizing agents
Reactive with acids
Evolves explosive concentration of vapor at normal room temperatures
Reactive with 1-perchorlyl-piperidine, dicyanofurazan
Forms complexes with heavy metal salts

**Chemical stability**

**Stability:** Stable under recommended storage conditions

**Possibility of Hazardous Reactions:** Reacts vigorously with oxidizing agents

**Conditions to avoid:** Heat. Ignition sources. Incompatible materials.

**Incompatible Materials:** Strong oxidizing agents. Acids. 1-pechorlyl-piperidine. dicyanofurazan. Heavy metal salts.

**Hazardous decomposition products:** Carbon oxides.

**Other Information**

**Product code:** P1146

**Product name:** PIPERIDINE, REAGENT
Corrosivity: No information available

Special Remarks on Corrosivity: No information available

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Principal Routes of Exposure:
Skin, Inhalation, Ingestion, Eyes.

Acute Toxicity

Component Information

Piperidine - 110-89-4

LD50/oral/rat = 400 mg/kg Oral LD50 Rat
LD50/oral/mouse = 536 mg/kg Oral LD50 Mouse
LD50/dermal/rat = 275-1000 mg/kg
LD50/dermal/rabbit = 0.32 ml/kg Dermal LD50 Rabbit
LC50/inhalation/rat = > 2000 ppm 4h
LC50/inhalation/mouse = 1723 ppm 1h
Other LD50 or LC50 information = No information available

Product Information

LD50/oral/rat =
VALUE-Acute Tox Oral = 30mg/kg

LD50/oral/mouse =
Value - Acute Tox Oral = 536mg/kg

LD50/dermal/rabbit
VALUE-Acute Tox Dermal = 0.32mL/kg

LD50/dermal/rat
VALUE -Acute Tox Dermal = 275mg/kg

LC50/inhalation/rat
VALUE-Vapor = > 2000ppm (4-hr)
VALUE-Gas = No information available
VALUE-Dust/Mist = No information available

LC50/Inhalation/mouse
VALUE-Vapor = 1723 ppm
VALUE - Gas = No information available
VALUE - Dust/Mist = No information available

Symptoms

Skin Contact: Corrosive. Severe skin irritation.

Eye Contact: Corrosive. Severe eye irritation.
Inhalation
Inhalation of mist or vapors may cause respiratory tract irritation. Symptoms may include sore throat, burning sensation, cough, shortness of breath, labored breathing/asthmatic breathing, dizziness, headache. It may also cause paralysis of vocal cords.

Ingestion
Corrosive. Causes severe digestive (gastrointestinal) tract irritation with nausea, vomiting and possible burns. May affect respiration (hypoxia, dyspnea), cardiovascular system (hypertension, hypotension, tachycardia), liver (hepatitis, jaundice, hepatocellular necrosis), blood (methemoglobinemia), urinary system (renal failure, albuminuria, hematuria, proteinuria, chemical burns), behavior/central nervous system (somnolence, headache, dizziness, tremor, paresthesia, fatigue, and even coma and death at high levels).

Aspiration hazard
No information available

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Chronic Toxicity
No information available

Sensitization:
No information available

Mutagenic Effects:
No information available

Carcinogenic effects:
Not considered carcinogenic

<table>
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<tr>
<th>Components</th>
<th>ACGIH - Carcinogens</th>
<th>IARC</th>
<th>NTP</th>
<th>OSHA HCS - Carcinogens</th>
<th>Australia - Prohibited Carcinogenic Substances</th>
<th>Australia - Notifiable Carcinogenic Substances</th>
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<tr>
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<td>Not listed</td>
<td>Not listed</td>
<td>Not listed</td>
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</table>

Reproductive toxicity
No data is available

Reproductive Effects: No information available

Developmental Effects: No information available

Teratogenic Effects: No information available

Specific Target Organ Toxicity

STOT - single exposure
No information available

STOT - repeated exposure
No information available

Target Organs:
No information available

12. ECOLOGICAL INFORMATION

Ecotoxicity

Ecotoxicity effects: No data available.

Piperidine - 110-89-4

Freshwater Fish Species Data: LC50- Leuciscus idus (Golden orfe) 46-100 mg/l 96h

Persistence and degradability: Readily biodegradable

Bioaccumulative potential: No information available
13. DISPOSAL CONSIDERATIONS

Disposal Methods

Waste from residues / unused products:
Waste must be disposed of in accordance with Federal, State and Local regulation.

Contaminated packaging:
Empty containers should be taken for local recycling, recovery or waste disposal

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<tbody>
<tr>
<td>Piperidine</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>

14. TRANSPORT INFORMATION

DOT
- UN-No: UN2401
- Proper Shipping Name: Piperidine
- Hazard Class: 8
- Subsidiary Risk: 3
- Packing Group: I
- ERG No: 132
- Marine Pollutant: No data available
- DOT RQ (lbs): No information available

Symbol(s):

TDG (Canada)
- UN-No: UN2401
- Proper Shipping Name: Piperidine
- Hazard Class: 8
- Subsidiary Risk: (3)
- Packing Group: I
- Description: No information available

ADR
- UN-No: UN2401
- Proper Shipping Name: Piperidine
- Hazard Class: 8
- Packing Group: I
- Subsidiary Risk: 3
- Classification Code: No information available
- Description: No information available
- CEFIC Tremcard No: No information available

IMO / IMDG
- UN-No: UN2401
- Proper Shipping Name: Piperidine
- Hazard Class: 8
- Subsidiary Risk: 3
- Packing Group: I
14. TRANSPORT INFORMATION

Description: No information available
IMDG Page: No information available
Marine Pollutant: No information available
EMS: F-E
MFAG: No information available
Maximum Quantity: No information available

RID
UN-No: UN2401
Proper Shipping Name: Piperidine
Hazard Class: 8
Subsidiary Risk: 3
Packing Group: I
Classification Code: No information available
Description: No information available

ICAO
UN-No: UN2401
Proper Shipping Name: Piperidine
Hazard Class: 8
Subsidiary Risk: 3
Packing Group: I
Description: No information available

IATA
UN-No: UN2401
Proper Shipping Name: Piperidine
Hazard Class: 8
Subsidiary Risk: 3
Packing Group: I
ERG Code: 8F
Description: No information available

15. REGULATORY INFORMATION

International Inventories

<table>
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<tr>
<th>Components</th>
<th>U.S. TSCA</th>
<th>KOREA KECL</th>
<th>Philippines (PICCS)</th>
<th>Japan ENCS (5)-765</th>
<th>CHINA</th>
<th>Australia (AICS)</th>
<th>EINECS-No.</th>
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<tbody>
<tr>
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<td>Present KE-28769</td>
<td>Present</td>
<td>Present (5)-765</td>
<td>Present</td>
<td>Present</td>
<td>Present 203-813-0</td>
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</table>

U.S. Regulations

**Piperidine**
- Massachusetts RTK: Present
- New Jersey RTK Hazardous Substance List: 1543
- New Jersey (EHS) List: 1543 500 lb TPQ
- New Jersey - Discharge Prevention - List of Hazardous Substances: Present
- New Jersey TCPA - EHS: =15000 lb TQ
- Pennsylvania RTK: Environmental hazard
- Pennsylvania RTK - Environmental Hazard List: Present
- Pennsylvania RTK - Special Hazardous Substances: Present
- Minnesota - Hazardous Substance List: Present
- New York Release Reporting - List of Hazardous Substances: = 1 lb RQ
- FDA - Direct Food Additives: 21 CFR 172.515
- FDA - 21 CFR - Total Food Additives: 172.515

Product code: P1146
Product name: PIPERIDINE, REAGENT
Piperidine


Chemicals Known to the State of California to Cause Cancer:
This product does not contain a chemical requiring a warning under California Prop. 65. (See table below)

Chemicals Known to the State of California to Cause Reproductive Toxicity:
This product does not contain a chemical requiring a warning under California Prop. 65. (See table below)

<table>
<thead>
<tr>
<th>Components</th>
<th>Carcinogen</th>
<th>Developmental Toxicity</th>
<th>Male Reproductive Toxicity</th>
<th>Female Reproductive Toxicity</th>
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CERCLA/SARA

<table>
<thead>
<tr>
<th>Components</th>
<th>CERCLA - Hazardous Substances and their Reportable Quantities</th>
<th>Section 302 Extremely Hazardous Substances and TPQs</th>
<th>Section 302 Extremely Hazardous Substances and RQs</th>
<th>Section 313 - Chemical Category</th>
<th>Section 313 - Reporting de minimis</th>
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</thead>
<tbody>
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<td>None</td>
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U.S. TSCA

<table>
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<tr>
<th>Components</th>
<th>TSCA Section 5(a)2 - Chemicals With Significant New Use Rules (SNURS)</th>
<th>TSCA 8(d) - Health and Safety Reporting</th>
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</thead>
<tbody>
<tr>
<td>Piperidine</td>
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<td>Not Applicable</td>
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</tbody>
</table>

Canada

WHMIS hazard class:
Non-controlled

Canada Controlled Products Regulation:
This product has been classified according to the hazard criteria of the CPR (Controlled Products Regulation) and the MSDS contains all of the information required by the CPR.

Inventory

<table>
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<tr>
<th>Components</th>
<th>Canada (DSL)</th>
<th>Canada (NDSL)</th>
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<tbody>
<tr>
<td>Piperidine</td>
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</table>

EU Classification

R-phrase(s)
R11 - Highly flammable.
R34 - Causes burns.
R23/24 - Toxic by inhalation and in contact with skin.

Product code: P1146  Product name: PIPERIDINE, REAGENT
**S -phrase(s)**

S16 - Keep away from sources of ignition - No smoking.
S26 - In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S27 - Take off immediately all contaminated clothing.
S45 - In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
S 1/2 - Keep locked up and out of the reach of children.

<table>
<thead>
<tr>
<th>Components</th>
<th>Classification</th>
<th>Concentration Limits:</th>
<th>Safety Phrases</th>
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The product is classified in accordance with Annex VI to Directive 67/548/EEC

**Indication of danger:**

F - Highly flammable.
T - Toxic
C - Corrosive.

![Danger Symbols]

**16. OTHER INFORMATION**
16. OTHER INFORMATION

Disclaimer:

All chemicals may pose unknown hazards and should be used with caution. This Safety Data Sheet (SDS) applies only to the material as packaged. If this product is combined with other materials, deteriorates, or becomes contaminated, it may pose hazards not mentioned in this SDS. The physical properties reported in this SDS are obtained from the literature and do not constitute product specifications. Information contained herein does not constitute a warranty, whether expressed or implied, as to the safety, merchantability or fitness of the goods for a particular purpose. Spectrum Chemicals & Laboratory Products, Inc. assumes no responsibility for results obtained or for incidental or consequential damages, including lost profits, arising from the use of these data. No warranty against infringement of any patent, copyright or trademark is made or implied. It shall be the user's responsibility to develop proper methods of handling and personal protection based on the actual conditions of use. While this SDS is based on technical data judged to be reliable, Spectrum assumes no responsibility for the completeness or accuracy of the information contained herein.

End of Safety Data Sheet