SAFETY DATA SHEET

Preparation Date: No data available **Revision Date:** 03/28/2015 **Revision Number:** G1

Product identifier

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)
Contact Person: 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

Flammable liquids	Category 2

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

Hazards not otherwise classified (HNOC)
Not Applicable

Other hazards
Can react vigorously with oxidizing materials

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 CO_2, 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.

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

Components	CAS-No.	Weight %	Trade Secret
Piperidine 110-89-4	110-89-4	100	*

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.

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 segrated and approved area.

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

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

National occupational exposure limits

United States

Components	OSHA	NIOSH	ACGIH	AIHA WHEEL
Piperidine - 110-89-4	None	None	None	= 1 ppm TWA

Canada

Components	Alberta	British Columbia	Ontario	Quebec
Piperidine - 110-89-4	None	= 1 ppm TWA	None	None

Australia and Mexico

Components	Australia	Mexico
Piperidine 110-89-4	3.5 mg/m^3 TWA 1 ppm TWA	None

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

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Physical state:
Liquid

Appearance:
Liquid.

Color:
Colorless.

Odor:
Amine-like. Sweetish. Floral.

Taste
Burning. Pepper.

Molecular/Formula weight:
85.15 g/mol

Formula:
C5H11N

Flash point (°C):
16°C

Flashpoint (°C/°F):
16°C/ 61°F

Flash Point Tested according to:
Closed cup

Lower Explosion Limit (%):
No information available

Upper Explosion Limit (%):
No information available

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

pH:
No information available

Melting point/range(°C/°F):
-7°C/ 19.4°F

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

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

Bulk density:
No information available

Specific gravity:
0.8622

Vapor pressure @ 20°C (kPa):
5.3

Density (g/cm3):
0.862

Evaporation rate:
No information available

Vapor density:
3.0

VOC content (g/L):
No information available

Odor threshold (ppm):
No information available

Partition coefficient (n-octanol/water):
0.84

Viscosity:
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

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 wtih 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

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 LC50information = 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 breathikng/ asthmatic breathing, dizziness, headache. It may also cause paraalysis 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 (hepatits, 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

Components	ACGIH - Carcinogens	IARC	NTP	OSHA HCS - Carcinogens	Australia - Prohibited Carcinogenic Substances	Australia - Notifiable Carcinogenic Substances
Piperidine	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed

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

Mobility: 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

Components	RCRA - F Series Wastes	RCRA - K Series Wastes	RCRA - P Series Wastes	RCRA - U Series Wastes
Piperidine	None	None	None	None

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

Components	U.S. TSCA	KOREA KECL	Philippines (PICCS)	Japan ENCS	CHINA	Australia (AICS)	EINECS-No.
Piperidine	Present	Present KE-28769	Present	Present (5)-765	Present	Present	Present 203-813-0

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: =15000lbTQ
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

Piperidine

California Prop. 65: Safe Drinking Water and Toxic Enforcement Act of 1986.

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)

Components	Carcinogen	Developmental Toxicity	Male Reproductive Toxicity	Female Reproductive Toxicity:
Piperidine	Not Listed	Not Listed	Not Listed	Not Listed

CERCLA/SARA

Components	CERCLA - Hazardous Substances and their Reportable Quantities	Section 302 Extremely Hazardous Substances and TPQs	Section 302 Extremely Hazardous Substances and RQs	Section 313 - Chemical Category	Section 313 - Reporting *de minimis*
Piperidine	None	1000 lb TPQ 1000	None	None	None

U.S. TSCA

Components	TSCA Section 5(a)2 - Chemicals With Significant New Use Rules (SNURS)	TSCA 8(d) -Health and Safety Reporting
Piperidine	Not Applicable	Not Applicable

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

Components	Canada (DSL)	Canada (NDSL)
Piperidine	Present	Not Listed

Components	CEPA Schedule I - Toxic Substances	CEPA - 2010 Greenhouse Gases Subject to Manditory Reporting
Piperidine	Not listed	Not listed

EU Classification

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

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.

Components	Classification	Concentration Limits:	Safety Phrases
Piperidine	F; R11 T; R23/24 C; R34	5%<=C: T; R23/24-34 1%<=C<5%: Xn; R20/21-36/38	S1/2 S16 S26 S27 S45

The product is classified in accordance with Annex VI to Directive 67/548/EEC

Indication of danger:
F - Highly flammable.
T - Toxic
C - Corrosive.

16. OTHER INFORMATION

16. OTHER INFORMATION

Revision Date: 03/28/2015
Prepared by: Sonia Owen

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