

Nicotine -MATERIAL SAFETY DATA SHEET

Manufacturer/information service:

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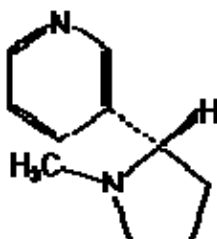
1. Chemical Product Identification

Product Name: Nicotine

Molecular Formula: $C_{10}H_{14}N_2$

Molecular Weight: 162.23

Structural Formula:



Chemical Name: (S)-3-(1-methylpyrrolidin-2-yl)pyridine

Form: Oily liquid

Color: Colorless to yellowish-brown

Odor: Slight fish odor

CAS No.: 54-11-5

2. Composition / Information on Ingredients

Composition	CAS No.	Content
Nicotine	54-11-5	99%
Other ingredients		1%

3. Hazards Identification

Potential Acute Health Effects:

Very hazardous in case of skin contact, ingestion. Hazardous in case of skin contact, eye contact, inhalation. Severe over-exposure can result in death.

Potential chronic health effects:

Carcinogenic effects: Not available.

Mutagenic effects: Mutagenic for bacteria and/or yeast.

Teratogenic effects: Not available.

Developmental toxicity: Not available.

The substance is toxic to the nervous system, cardiovascular system, upper respiratory tract, central nervous system (CNS).

Repeated or prolonged exposure to the substance can produce target organs damage. Repeated exposure to a highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

4. First Aid Measures

Eye contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention.

Skin contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious skin contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Serious inhalation: Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek medical attention.

Ingestion: If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Serious Ingestion: Not available.

5. Fire-Fighting Measures

Flammability: may be combustible at high temperature.

Auto-ignition temperature: 244°C (471.2°F)

Flash points:

Closed cup: 95°C (203°F).

Open cup: 101°C (213.8°F).

Flammable limits: lower: 0.7% upper: 4%

Products of combustion: These products are carbon oxides (CO, CO₂), nitrogen oxides (NO, NO₂...).

Fire hazards in presence of various substances:

Slightly flammable to flammable in presence of open flames and sparks, of heat.

Non-flammable in presence of shocks.

Explosion hazards in presence of various substances:

Risks of explosion of the product in presence of mechanical impact: not available.

Risks of explosion of the product in presence of static discharge: not available.

Fire fighting media and instructions:

Small fire: use dry chemical powder.

Large fire: use water spray, fog or foam. Do not use water jet.

Special Remarks on Fire Hazards: When heated to decomposition it emits highly toxic fumes.

Special Remarks on Explosion Hazards: Not available.

6. Accidental Release Measures

Small Spill:

Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.

Large Spill:

Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Prevent entry into sewers, basements or confined areas; dike if needed. Eliminate all ignition sources. Call for assistance on disposal. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

7. Handling and Storage

Precautions:

Keep away from heat. Keep away from sources of ignition. Empty containers pose a fire risk, evaporate the residue under a fume hood. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/vapor/spray. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, acids.

Storage: Keep container tightly closed. Keep container in a cool, well-ventilated area.

8. Exposure Controls/Personal Protection

Engineering Controls:

Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection:

Splash goggles, lab coat, gloves, vapor respirator. Be sure to use an approved/certified respirator or equivalent.

Personal Protection in Case of a Large Spill:

Splash goggles, full suit, vapor respirator, boots, gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist before handling this product.

Exposure Limits:

TWA: 0.5 STEL: 1.5mg/m³ (Canada) skin

TWA: 0.5mg/m³ from OSHA (PEL) [United States] skin

TWA: 0.5mg/m³ from NIOSH (United States) skin

TWA: 0.5 STEL: 1.5 mg/m³ (United Kingdom) skin

TWA: 0.5mg/m³ from ACGIH (TLV) [United States] skin consult local authorities for acceptable exposure limits.

9. Physical and Chemical Properties

Appearance: Colorless to yellowish-brown oily liquid

Odor: Slight fish odor

pH (1% soln/water): Not available.

Boiling Point: 247°C (476.6°F) @ 760 mm Hg

Melting Point: -79°C (-110.2°F)

Critical Temperature: Not available.

Specific Gravity: 1.0097 (Water = 1)

Vapor Pressure: Not available.

Vapor Density: 5.61 (Air = 1)

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: The product is more soluble in oil; log(oil/water) = 1.2

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water, diethyl ether.

Solubility: Easily soluble in diethyl ether. Soluble in cold water. Miscible with water below 60°C. Very soluble in alcohol, chloroform, petroleum ether, kerosene oils.

10. Stability and Reactivity

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Heat, ignition sources, incompatible materials

Incompatibility: Reactive with oxidizing agents, acids.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity: Not available.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

11. Toxicological Information

Routes of Entry: Absorbed through skin, dermal contact, inhalation, ingestion.

Toxicity to Animals:

Acute oral toxicity (LD50): 3.34 mg/kg [Mouse].

Acute dermal toxicity (LD50): 50 mg/kg [Rabbit].

Chronic Effects on Humans:

Mutagenic effects: Mutagenic for bacteria and/or yeast.

Causes damage to the following organs: t cardiovascular system, the nervous system, upper respiratory tract, central nervous system (CNS).

Other Toxic Effects on Humans:

Very hazardous in case of skin contact, ingestion. Hazardous in case of skin contact, inhalation.

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans:

Human: passes through the placenta, excreted in maternal milk. May cause adverse reproductive effects and birth defects (teratogenic)

Special Remarks on other Toxic Effects on Humans:

Acute Potential Health Effects:

Skin: It can cause skin irritation and rash. It may cause dermatitis. It is well absorbed by dermal exposure route. May be fatal if absorbed through skin. Systemic effects similar to that of ingestion can occur from nicotine poisoning.

Eyes: It can cause eye irritation. Severe pain, lacrimation, conjunctival reaction, corneal infiltration, partial opacification of cornea.

Inhalation: It is well absorbed by inhalation exposure route. Inhalation can produce systemic effects similar to that of ingestion.

Ingestion: May be fatal if swallowed. It can cause gastrointestinal tract irritation/disturbances with nausea, vomiting, diarrhea, stomach pain, burning sensation of the mouth, throat, esophagus, and stomach, loss of appetite. Metabolic acidosis and hypokalemia can develop if there is severe diarrhea. It acts on the central nervous system and other parts of the nervous system such as the adrenal medulla, autonomic ganglia, and neuromuscular junctions with initial stimulation followed by depression. Early signs of toxicity from small doses include nausea, vomiting, headache, dizziness, tachycardia, hypertension, tachypnea, hyperpnea, sweating, and salivation. High exposure can cause dizziness, headache, tremors, anxiety, restlessness, seizures, hypotonia, decreased deep tendon reflexes progressing to paralysis, fasciculations, convulsions, weakness, incoordination, hallucinations, confusion, coma. Hypertension, tachycardia, and tachypnea followed by hypotension, bradycardia, and dyspnea, bradypnea can occur. Tachypnea is one of the principle signs nicotine poisoning. Respiratory failure may also occur. Other symptoms can include weak, rapid, and irregular pulse. Vasoconstriction, atrial fibrillation, and sinoatrial block, and ventricular fibrillation have also all been reported. Death is usually from respiratory depression secondary to CNS depression and peripheral blockade of respiratory muscles.

12. Ecological and Ecotoxicological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation: Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.

Special Remarks on the Products of Biodegradation: Not available.

13. Disposal Considerations

Waste Disposal: Waste must be disposed of in accordance with federal, state and local environmental control regulations.

14. Transport Information

Not applicable.

15. Regulatory Information

Not applicable.

16. Other Information

All information and instructions provided in this Material Safety Data Sheet (MSDS) are based on the current state of scientific and technical knowledge at the date indicated on the present MSDS and are presented in good faith and believed to be correct. This information applies to the product as such. In case of new formulations or mixes, it is necessary to ascertain that a new danger will not appear. It is the responsibility of persons on receipt of this MSDS to ensure that the information contained herein is properly read and understood by all people who may use, handle, dispose or in any way come in contact with the product. If the recipient subsequently produce formulations containing this product, it is the recipients sole responsibility to ensure the transfer of all relevant information from this MSDS to their own MSDS.