

Material Safety Data Sheet

N-Methyl-2-pyrrolidone

Section 1: Chemical Product and Company Identification

Product Name: N-Methyl-2-pyrrolidinone

CAS#: 872-50-4

Synonym: N-Methyl Pyrrolidone

Chemical Name: N-Methyl-2-Pyrrolidinone

Chemical Formula: C₅H₉NO



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Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
{N-}Methyl{-2-}pyrrolidone	872-50-4	100

Toxicological Data on Ingredients: N-Methyl-2-pyrrolidinone: ORAL (LD50): Acute: 3914 mg/kg [Rat]. 5130 mg/kg [Mouse]. DERMAL (LD50): Acute: 8000 mg/kg [Rabbit].

Section 3: Hazards Identification

Potential Acute Health Effects:

Hazardous in case of eye contact (irritant), of ingestion, of inhalation. Slightly hazardous in case of skin contact (irritant, permeator).

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 may be toxic to blood, kidneys, lymphatic system, Urinary system, bone marrow. Repeated or prolonged exposure to the substance can produce target organs damage.

Section 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. Get medical attention.

Skin Contact: Wash with soap and water. Cover the irritated skin with an emollient. Get medical attention if irritation develops.

Serious Skin Contact: Not available.

Inhalation:

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

Serious Inhalation: Not available.

Ingestion:

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 if symptoms appear.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Combustible.

Auto-Ignition Temperature: 346.11°C (655°F)

Flash Points: CLOSED CUP: 92.778°C (199°F). OPEN CUP: 95.556°C (204°F).

Flammable Limits: LOWER: 1.3% UPPER: 9.5%

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: Not available.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill: Absorb with an inert material and put the spilled material in an appropriate waste disposal.

Large Spill:

Combustible material. Keep away from heat. Keep away from sources of ignition. Stop leak if without risk. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:

Keep locked up.. Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Avoid contact with eyes. 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. Keep away from incompatibles such as oxidizing agents, reducing agents, acids, alkalis.

Storage:

Hygroscopic. Keep container in a well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame). Store at room temperature.

Section 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. 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: 25 STEL: 75 (ppm) [United Kingdom (UK)] TWA: 103 STEL: 309 (mg/m³) [United Kingdom (UK)] TWA: 10 from AIHA TWA: 40 (mg/m³) from AIHA Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Liquid.

Odor: Amine like.

Taste: Not available.

Molecular Weight: 99.14 g/mole

Color: Colorless to light yellow. **pH**

(1% soln/water): Not available.

Boiling Point: 202°C (395.6°F)

Melting Point: -24°C (-11.2°F)

Critical Temperature: 451°C (843.8°F)

Specific Gravity: 1.026 (Water = 1)

Vapor Pressure: 0 kPa (@ 20°C)

Vapor Density: 3.4 (Air = 1)

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: The product is more soluble in water; log(oil/water) = -0.5

Ionicity (in Water): Not available.

Dispersion Properties: Not available.

Solubility:

Miscible with Castor Oil. Miscible with water, lower alcohols, ketones, ethyl acetate, chloroform and benzene.

Moderately soluble in aliphatic hydrocarbons and dissolves many organic and inorganic compounds.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Excess heat, moisture, incompatibles

Incompatibility with various substances:

Reactive with oxidizing agents, reducing agents, acids, alkalis. Slightly reactive to reactive with moisture.

Corrosivity: Not available.

Special Remarks on Reactivity:

Hygroscopic. Incompatible with reducing agents, strong alkalis, strong mineral acids. Reacts with chlorinating agents (e.g. cobalt chloride, thionyl chloride, phosphorous oxychloride, pentachlorophosphorous to form the amide. Reacts with sulfur and carbon disulfide at high temperatures and pressures.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Eye contact. Inhalation.

Toxicity to Animals:

Acute oral toxicity (LD50): 3914 mg/kg [Rat]. Acute dermal toxicity (LD50): 8000 mg/kg [Rabbit].

Chronic Effects on Humans:

MUTAGENIC EFFECTS: Mutagenic for bacteria and/or yeast. May cause damage to the following organs: blood, kidneys, lymphatic system, Urinary system, bone marrow.

Other Toxic Effects on Humans:

Hazardous in case of ingestion, of inhalation. Slightly hazardous in case of skin contact (irritant, permeator).

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans:

May cause adverse reproductive effects (maternal effects - post implantation mortality, fetotoxicity) and birth defects based on animal. May affect genetic material. May cause cancer (tumorigenic) based on animal data.

Special Remarks on other Toxic Effects on Humans:

Acute Potential Health Effects: Skin: Causes skin irritation. May be absorbed through skin. Eyes: Causes moderate eye irritation. Inhalation: Causes respiratory tract irritation. May affect respiration (dyspnea), gastrointestinal tract (abdominal pain, nausea, vomiting and inflammation of gums and mouth, behavior/Central Nervous system (somnolence, muscle weakness, dizziness, drowsiness, headache), and urinary system. Ingestion: May cause gastrointestinal tract irritation with nausea, vomiting and diarrhea. May affect behavior/Central Nervous System (similar symptoms to inhalation) metabolism, blood and urinary tract.

Section 12: Ecological 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 product itself and its products of degradation are not toxic.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:

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

Section 14: Transport Information

DOT Classification: Not a DOT controlled material (United States).

Identification: Not applicable.

Special Provisions for Transport: Not applicable.

Section 15: Other Regulatory Information

Federal and State Regulations:

Pennsylvania RTK: N-Methyl-2-pyrrolidinone Minnesota: N-Methyl-2-pyrrolidinone Massachusetts RTK: N-Methyl-2-pyrrolidinone New Jersey: N-Methyl-2-pyrrolidinone New Jersey spill list: N-Methyl-2-pyrrolidinone TSCA 8(b) inventory: N-Methyl-2-pyrrolidinone TSCA 4(a) final test rules: N-Methyl-2-pyrrolidinone TSCA 8(a) IUR: N-Methyl-2-pyrrolidinone TSCA 12(b) one time export: N-Methyl-2-pyrrolidinone SARA 313 toxic chemical notification and release reporting: N-Methyl-2-pyrrolidinone

Other Regulations:

OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada):

CLASS B-3: Combustible liquid with a flash point between 37.8°C (100°F) and 93.3°C (200°F).

DSCL (EEC):

R36- Irritating to eyes. S2- Keep out of the reach of children. S46- If swallowed, seek medical advice immediately and show this container or label.

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 2

Reactivity: 0

Personal Protection: j

National Fire Protection Association (U.S.A.):

Health: 2

Flammability: 1

Reactivity: 0

Specific hazard:

Protective Equipment:

Not applicable. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

Section 16: Other Information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.