

IN CASE OF TRANSPORTATION EMERGENCY CONTACT:

**CHEMTREC:(800) 424-9300**

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ALL OTHER INQUIRIES:  
(770) 904-7042 // [www.ciscochem.com](http://www.ciscochem.com)  
266 Rue Cezzan Lavonia, GA 30553



## 1. IDENTIFICATION

PRODUCT NAME: N-Methyl-2-pyrrolidinone  
CAS #: 872-50-4  
SYNONYM: NMP  
RECOMMENDED USE: This product is recommended for laboratory and manufacturing use only. It is not recommended for drug, food or household use.

## 2. 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.

HMIS Rating:  
Health – 1 Flammability – 2 Physical Hazard – 1 PPE – User supplied  
NOTE: HMIS ratings use a numbering scale that ranges from 0 - 4 to indicate the degree of hazard. A value of zero means the chemical presents no hazard while a value of four indicates a high hazard. These ratings are based on the inherent properties of this chemical under expected conditions of normal use and are not intended to be used in emergency situations. PPE is determined by the user based on their needs and conditions.

SIGNAL WORD: WARNING!!

Combustible liquid and vapor.  
Causes mild skin irritation  
Causes eye irritation  
May cause respiratory irritation  
May damage fertility or the unborn child

## 3. COMPOSITION

PRODUCT NAME:	CAS #	% BY WEIGHT
1-Methyl-2pyrrolidinone	872-50-4	99-100%

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].

#### 4. FIRST AID MEASURES

Inhalation: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Ingestion: Do not induce vomiting unless directed by medical personnel. If vomiting occurs naturally, have victim lean forward. Never give anything by mouth to an unconscious person. Get medical aid.

Skin Contact: Remove any contaminated clothing. Wash skin with soap or mild detergent and water for at least 15 minutes. Get medical attention.

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

Notes to Physician: Treat symptomatically and supportively.

#### 5. FIRE FIGHTING MEASURES

Flammability: Combustible liquid and vapor. (GHS Category 4)

Auto-ignition Temperature: 245o C (473o F)

Flash Point: 91o C (195o F)

Flammable Limits: Lower Limit – 1.3 vol %, Upper Limit – 9.5 vol %

Products of Combustion: May decompose into irritating and highly toxic gases under fire conditions (nitrogen oxides, carbon monoxide, carbon dioxide).

Specific Fire Hazards: As in any fire, always wear self-contained breathing apparatus in pressure-demand (MSA/NIOSH approved or equivalent), and full protective gear. Use water spray to keep fire exposed containers cool. Approach fire from upwind to avoid hazardous vapors and toxic decomposition products.

Specific Explosion Hazards: No information available.

Fire Fighting Media: Use dry chemical, carbon dioxide, water spray, or appropriate foam.

National Fire Protective Association: Health - 2, Flammability - 2, Reactivity - 0

NOTE: NFPA ratings use a numbering scale that ranges from 0 - 4 to indicate the degree of hazard. A value of zero means the chemical presents no hazard while a value of four indicates a high hazard. They are for use by emergency personnel to address the hazards that are presented by short term, acute exposure to this product under fire, spill, or similar emergencies. Ratings involve data and interpretations that may vary from company to company.

#### 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.

#### 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 cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame). Do not store above 24°C (75.2°F). Preferably refrigerate.

## 8. EXPOSURE CONTROLS AND 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/m<sup>3</sup>) [United Kingdom (UK)] TWA: 10 from AIHA  
TWA: 40 (mg/m<sup>3</sup>) from AIHA Consult local authorities for acceptable exposure limits.

## 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.

## 10. STABILITY AND REACTIVITY

Stability: Stable at room temperature in closed container under normal handling and storage conditions.

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 alkalies, 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.

## 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.

## 12. ECOLOGICAL INFORMATION

Ecotoxicity:

Daphnia: EC50, 4897 mg/L, 48H

Fish: Gold orfe: LC50 4000 mg/L, 96H

Bacteria: EC50, >9000 mg/L, 48H

Algae: IC50, >500mg/L, 72H

Log Pow = -0.46 (25o C); BOD = 110 mg/L; COD = 1600 mg/L

Environmental Fate: No information available.

Physical: No information 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.

### 13. DISPOSAL CONSIDERATIONS

Material that cannot be saved for recovery or recycling should be managed in an appropriate and approved waste facility. Processing, use or contamination of this product may change the waste management options. Waste generators must decide if discarded material is a hazardous waste. State and local disposal regulations may differ from federal disposal definitions found in 40 CFR 261.3.

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

### 14. TRANSPORT INFORMATION

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

Identification: Not applicable.

Special Provisions for Transport: Not applicable.

### 15. 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.

### 16. OTHER INFORMATION

The information contained herein is based on current knowledge and experience; no responsibility is accepted that the information is sufficient or correct in all cases. Users should consider these data only as a supplement to other information gathered by them and

must make independent determinations of suitability and completeness of information from all sources to assure proper use and disposal of these materials and the safety and health of employees and customers and the protection of the environment.

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