

MATERIAL SAFETY DATA SHEET

NFPA	HMIS	Personal Protective Equipment						
	<table border="1"> <tr> <td style="background-color: #0000FF; color: white;">Health Hazard</td> <td style="text-align: center;">2</td> </tr> <tr> <td style="background-color: #FF0000; color: white;">Fire Hazard</td> <td style="text-align: center;">2</td> </tr> <tr> <td style="background-color: #FFFF00; color: black;">Reactivity</td> <td style="text-align: center;">0</td> </tr> </table>	Health Hazard	2	Fire Hazard	2	Reactivity	0	
Health Hazard	2							
Fire Hazard	2							
Reactivity	0							
See Section 8.								

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product code:	M1280
Product Name:	1-METHYL-2-PYRROLIDINONE, REAGENT, ACS
Chemical Name:	2-Pyrrolidinone, 1-methyl-
Synonyms:	1-Methyl-2-pyrrolidinone 1-Methyl-2-pyrrolidone 1-Methyl-5-pyrrolidinone M-Pyrol N-Methyl-2-pyrrolidone N-Methyl-alpha-pyrrolidone N-Methylpyrrolidinone N-Methylpyrrolidone NMP Methyl Pyrrolidone
Recommended use:	Solvent.
CAS #:	872-50-4
Formula:	C5-H9-N-O
RTECS #	UY5790000
CI#:	Not available
Supplier:	Spectrum Chemicals and Laboratory Products, Inc. 14422 South San Pedro St. Gardena, CA 90248 (310) 516-8000
Emergency Telephone Number:	CHEMTREC: 1-800-424-9300
Contact Person:	Martin LaBenz (West Coast)
Contact Person:	Chris Terpak (East Coast)

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW			
WARNING! IRRITANT. Irritating to skin. Irritating to eyes. Irritating to respiratory system. WARNING! COMBUSTIBLE LIQUID.			
Odor: Mild. Amine-like.	Physical state: Liquid.	Appearance: No information available	Color: Colorless. Light yellow.

2. HAZARDS IDENTIFICATION

OSHA Regulatory Status This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200)

POTENTIAL HEALTH EFFECTS

Principal Routes of Exposure:

Skin. Eyes. Inhalation. Ingestion.

Acute Potential Health Effects:

Skin Contact:

Irritating to skin. It may be absorbed through the skin.

Eye Contact:

Causes eye irritation. Moderately irritating to the eyes.

Inhalation:

Irritating to respiratory system. May cause central nervous system effects. May affect respiration. May cause build-up of fluid in the lungs (pulmonary edema).

Ingestion:

Ingestion may cause gastrointestinal irritation, nausea, vomiting, and diarrhoea. May cause central nervous system effects. May affect the liver. It may affect the kidneys. May affect the blood. May affect the bone marrow.

Chronic Potential Health Effects:

Target Organs:

Central nervous system. Skin. Liver. Kidneys. Blood. Respiratory system. Spleen. Bone Marrow. Thymus.

Carcinogen Status:	No information available
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Mutagenic Effects:

May affect genetic material
Experiments with bacteria and/or yeast have shown mutagenic effects

Teratogenic Effects:

May cause birth defects (teratogenic effects) based on animal test data
Showed teratogenic effects in animal experiments

Aggravated Medical Conditions: No information available

See Section 11 for additional Toxicological Information

POTENTIAL ENVIRONMENTAL EFFECTS

No information available

3. COMPOSITION/INFORMATION ON INGREDIENTS

Components	CAS-No.	Weight %
N-Methyl-2-pyrrolidinone	872-50-4	100

4. FIRST AID MEASURES

General Advice:

Poison information centres in each State capital city can provide additional assistance for scheduled poisons (13 1126)

Skin Contact:	Wash off immediately with soap and plenty of water removing all contaminated clothes and shoes. Get medical attention. If skin irritation persists, call a physician.
Eye Contact:	Flush eye with water for 15 minutes. Get medical attention.
Inhalation:	Move to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.
Ingestion:	Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. Obtain medical attention.
Notes to Physician:	Treat symptomatically

5. FIRE-FIGHTING MEASURES

Flammable Properties

Flashpoint (°C/°F):	92.778 °C/199 °F 95.556 °C/204 °F
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Tested according to:

Closed cup
Open cup

Lower Explosion Limit (%):	1.3%
Upper Explosion Limit (%):	9.5%

Autoignition Temperature (°C/°F):	346.11 °C/655 °F
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Suitable Extinguishing Media: Dry chemical. Carbon dioxide (CO₂). Water spray mist or foam.

Unsuitable Extinguishing Media: High volume water jet. Do not use a solid (straight) water stream as it may scatter and spread fire.

Hazardous Combustion Products: carbon oxides; nitrogen oxides

Specific hazards: Combustible material. May be ignited by heat, sparks or flames. Vapors may form explosive mixtures with air. Most vapors are heavier than air. They will spread along the ground and collect in low or confined areas (sewers, basements, tanks). Container explosion may occur under fire conditions or when heated. It is combustible when exposed to powerful oxidizers.

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

Specific Methods: Water mist may be used to cool closed containers. For larger fires, use water spray or fog. Cool containers with flooding quantities of water until well after fire is out.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions:

Ensure adequate ventilation. Avoid contact with skin, eyes and clothing. Use personal protective equipment. Use spark-proof tools and explosion-proof equipment. All equipment used when handling the product must be grounded. Remove all sources of ignition.

Environmental Precautions:

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

Methods for Cleaning Up:

Absorb spill with inert material (e.g. vermiculite, dry sand or earth), then place in a suitable chemical waste container. Clean contaminated surface thoroughly.

7. HANDLING AND STORAGE

Handling

Technical Measures/Precautions:

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

Safe Handling Advice:

Wear personal protective equipment. Avoid contact with skin, eyes and clothing. In case of insufficient ventilation, wear suitable respiratory equipment. Keep away from heat and sources of ignition. Do not ingest. Do not breathe vapors or spray mist. Handle in accordance with good industrial hygiene and safety practice.

Storage

Technical Measures/Storage Conditions:

Hygroscopic. Keep container tightly closed in a dry and well-ventilated place. Store at room temperature in the original container. Keep away from heat and sources of ignition. Store in a segregated and approved area. Store away from incompatible materials.

Incompatible Products:

Oxidizing agents. Reducing agents. Acids. Bases.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering measures to reduce exposure:

Ensure adequate ventilation. Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors and mist below their respective threshold limit value.

Personal Protective Equipment

Eye protection: Goggles.

Skin and body protection: Long sleeved clothing. Chemical resistant apron. Gloves.

Respiratory protection: Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Respiratory protection is not necessary for normal handling. Good room ventilation or use of local exhaust (fume hood) is sufficient. Use a vapor respirator under conditions where exposure to the substance is apparent (e.g. generation of high concentrations of mist or vapor, inadequate ventilation, development of respiratory tract irritation), and engineering controls are not feasible. Be sure to use an approved/certified respirator or equivalent.

Hygiene measures: Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product. When using, do not eat, drink or smoke.

National occupational exposure limits

United States

U.S Occupational Exposure Limits:

Components	OSHA	NIOSH	ACGIH	AIHA WHEEL
N-Methyl-2-pyrrolidinone - 872-50-4	None	None	None	10 ppm TWA

Canada

Canada Occupational Exposure Limits:

Components	Alberta	British Columbia	Quebec	Ontario
N-Methyl-2-pyrrolidinone 872-50-4	None	None	None	400 mg/m ³ TWA

Australia and Mexico

Occupational Exposure Limits for Australia and Mexico:

Components	Australia	Mexico
N-Methyl-2-pyrrolidinone 872-50-4	75 ppm STEL 309 mg/m ³ STEL 25 ppm TWA 103 mg/m ³ TWA	None

9. PHYSICAL AND CHEMICAL PROPERTIES

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state: Liquid.	Appearance: No information available	Color: Colorless. Light yellow.
Odor: Mild. Amine-like.	Taste No information available	Molecular/Formula weight: 99.14
Flash point (°C): 92.778	Lower Explosion Limit (%): 1.3%	Upper Explosion Limit (%): 9.5%
Autoignition Temperature (°C/°F): 346.11 °C/655 °F	pH: No information available	Boiling point/range(°C/°F): 202 °C/395.6 °F
Melting point/range(°C/°F): -24 °C/-11.2 °F	Decomposition temperature(°C/°F): No information available	Specific gravity: 1.026
Density (g/cm³): No information available	Bulk density: No information available	Vapor pressure @ 20°C (kPa): 0.05
Vapor density: 3.4	Evaporation rate: 0.06 (Butyl acetate = 1)	VOC content (g/L): 1026
Odor threshold (ppm): No information available	Partition coefficient (n-octanol/water): -0.54	Miscibility: Miscible with water Miscible with Castor Oil Miscible with lower alcohols Miscible with ketones Miscible with Ethyl Acetate Miscible with Chloroform Miscible with Benzene

Solubility:

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

10. STABILITY AND REACTIVITY

Stability:	Stable at normal conditions
Conditions to avoid:	Heat. Ignition sources. Incompatible materials. Exposure to moist air.
Materials to avoid:	Oxidising agents. Reducing agents. Acids. Bases.
Hazardous decomposition products:	Carbon monoxide. Carbon dioxide. Nitrogen oxides (NO _x).
Possibility of Hazardous Reactions:	Hygroscopic. It absorbs moisture from the air It reacts with chlorinating agents (e.g. cobalt chloride, thionyl chloride, phosphorous oxychloride, pentachlorophosphorous) to form the amide It reacts with sulfur and carbon disulfide at high temperatures and pressures
Polymerization:	Hazardous polymerisation does not occur
Corrosivity:	No information available
Special Remarks on Corrosivity:	No information available

11. TOXICOLOGICAL INFORMATION

Acute Toxicity

Component Information

N-Methyl-2-pyrrolidinone - 872-50-4

LD50/oral/rat = 3598 mg/kg (LOLI)

3914 mg/kg (RTECS)

LD50/oral/mouse = 5130 mg/kg

LD50/dermal/rabbit = 2000 mg/kg Dermal LD50 Rabbit

LD50/dermal/rat = 2500 mg/kg

LC50/inhalation/rat = 3.1 mg/L 4 h

LC50/inhalation/mouse = No information available

Other LD50 information =

No information available

Product Information

LC50/inhalation/rat = 3.1 mg/L 4 h

LC50/Inhalation/mouse = No information available

LD50/dermal/rabbit = 2000 mg/kg

8000 mg/kg

LD50/dermal/rat = 2500 mg/kg

LD50/oral/rat = 3598 mg/kg (LOLI)

3914 mg/kg (RTECS)

LD50/oral/mouse = 5130 mg/kg

Local Effects

Skin irritation:

Causes skin irritation.

Eye irritation:

Causes eye irritation. Moderate eye irritation.

Inhalation:

Irritating to respiratory system.

Ingestion:

Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhoea. May cause abdominal pain.

Sensitization:

No information available

Chronic Toxicity

Chronic Toxicity

Prolonged or repeated inhalation may cause difficulty breathing, shortness of breath, and pulmonary edema. Prolonged or repeated inhalation may affect the kidneys. Prolonged or repeated inhalation may affect metabolism (weight loss). Prolonged or repeated inhalation may affect the blood (changes in white blood cell count). Prolonged or repeated ingestion may affect the spleen. Prolonged or repeated ingestion may affect the liver, and kidneys. Prolonged or repeated ingestion may affect the blood (changes in serum composition). Prolonged or repeated ingestion may affect the blood (changes in platelet count). Prolonged or repeated inhalation or ingestion may affect the central nervous system (somnolence, muscle weakness, headache, dizziness). Prolonged skin contact may cause skin irritation and/or dermatitis. Symptoms of skin irritation may include skin rash, blisters, and redness. Prolonged or repeated skin contact may cause dryness of the skin.

Carcinogenic effects:

May cause cancer based on animal test data. Tumorigenic agent by RTECS criteria.

Components	NTP	IARC	OSHA HCS - Carcinogens	ACGIH - Carcinogens	Australia - Prohibited Carcinogenic Substances	Australia - Notifiable Carcinogenic Substances
N-Methyl-2-pyrrolidinone	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed

Mutagenic Effects: May affect genetic material
Experiments with bacteria and/or yeast have shown mutagenic effects

Reproductive Effects: May cause adverse reproductive effects based on animal test data.

Teratogenic Effects: May cause birth defects (teratogenic effects) based on animal test data
Showed teratogenic effects in animal experiments

Target Organs: Central nervous system. Skin. Liver. Kidneys. Blood. Respiratory system. Spleen. Bone Marrow. Thymus.

12. ECOLOGICAL INFORMATION

ECOTOXICITY

Toxicity to terrestrial and aquatic plants and animals: Information given is based on data on the components and the ecotoxicology of similar products

Ecotoxicity effects: Aquatic environment.

Aquatic toxicity:

N-Methyl-2-pyrrolidinone - 872-50-4

Freshwater Algae Data: 500 mg/L EC50 *Desmodesmus subspicatus* 72 h

Freshwater Fish Species Data: 1072 mg/L LC50 *Pimephales promelas* 96 h static 1
1400 mg/L LC50 *Poecilia reticulata* 96 h static 1
4000 mg/L LC50 *Leuciscus idus* 96 h static 1
832 mg/L LC50 *Lepomis macrochirus* 96 h static 1

Water Flea Data: 4897 mg/L EC50 *Daphnia magna* 48 h

Mobility: No information available

Persistence and degradability: No information available

Bioaccumulative potential: No information available

13. DISPOSAL CONSIDERATIONS

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
N-Methyl-2-pyrrolidinone	None	None	None	None

14. TRANSPORT INFORMATION

DOT

UN-No: Not regulated
Proper Shipping Name: No information available
Hazard Class: No information available

Product code: M1280

Product name: 1-METHYL-2-PYRROLIDINONE, REAGENT, ACS

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Packing Group: None
Subsidiary Risk: Not applicable
Marine Pollutant: No data available
ERG No: No information available
DOT RQ (lbs): No information available

TDG (Canada)

Proper Shipping Name: No information available
UN-No: Not Regulated
Hazard Class: No information available
Packing Group: No information available
Subsidiary Risk: No information available
Description: No information available

ADR

Proper Shipping Name: No information available
UN-No: Not Regulated
Hazard Class: No information available
Packing Group: No information available
Subsidiary Risk: No information available
Classification Code: No information available
Description: No information available
CEFIC Tremcard No: No information available

IMO / IMDG

Proper Shipping Name: No information available
UN-No: Not Regulated
Hazard Class: No information available
Subsidiary Risk: No information available
Packing Group: No information available
Description: No information available
IMDG Page: No information available
Marine Pollutant: No information available
MFAG: No information available
Maximum Quantity: No information available

RID

Proper Shipping Name: No information available
UN-No: Not Regulated
Hazard Class: No information available
Packing Group: No information available
Subsidiary Risk: No information available
Classification Code: No information available
Description: No information available

ICAO

UN-No: Not Regulated
Hazard Class: No information available
Proper Shipping Name: No information available
Packing Group: No information available
Subsidiary Risk: No information available
Description: No information available

IATA

Proper Shipping Name: No information available
UN-No: Not Regulated
Hazard Class: No information available
Packing Group: No information available

Subsidiary Risk: No information available
Description: No information available

15. REGULATORY INFORMATION

International Inventories

Components	U.S. TSCA	Philippines (PICCS)	KOREA KECL	Japan ENCS	CHINA	Australia (AICS)	EINECS-No.
<i>N-Methyl-2-pyrrolidinone</i>	Present	Present	KE-25324	5-113	Present	Present	212-828-1

U.S. Regulations

N-Methyl-2-pyrrolidinone

Massachusetts RTK: Present
New Jersey RTK Hazard Substance: Present
New Jersey (EHS) List: Present
New Jersey - Discharge Prevention - List of Hazardous Substances Present
Pennsylvania RTK: Present

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:

WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm (See table below)

Components	Carcinogen	Developmental Toxicity	Male Reproductive Toxicity	Female Reproductive Toxicity:
<i>N-Methyl-2-pyrrolidinone</i>	Not Listed	developmental toxicity	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 <i>de minimis</i>
<i>N-Methyl-2-pyrrolidinone</i>	None	None	None	None	1.0 % de minimis concentration

U.S. TSCA

Components	TSCA Section 5(a)2 - Chemicals With Significant New Use Rules (SNURS)	TSCA 8(d) -Health and Safety Reporting
<i>N-Methyl-2-pyrrolidinone</i>	Not Applicable	Not Applicable

Canada

WHMIS hazard class:

B3 Combustible liquid
D2B Toxic materials

N-Methyl-2-pyrrolidinone

B3 D2B

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.

N-Methyl-2-pyrrolidinone

Inventory

Components	Canada (DSL)	Canada (NDSL)
N-Methyl-2-pyrrolidinone	Present	Not Listed

EU Classification

R -phrase(s)

R61 - May cause harm to the unborn child.
R36/37/38 - Irritating to eyes, respiratory system and skin.

S -phrase(s)

S45 - In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
S53 - Avoid exposure - obtain special instructions before use.

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

Indication of danger:

Xi - Irritant.

T - Toxic



16. OTHER INFORMATION

The MSDS format complies with ANSI Z400.1-2004 standards.

Preparation Date 27-Apr-2011

Reason for revision: Not applicable

Prepared by: Sonia Owen

Literature reference: No information available

All chemicals may pose unknown hazards and should be used with caution. This Material Safety Data Sheet (MSDS) 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 MSDS. The physical properties reported in this MSDS 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 MSDS is based on technical data judged to be reliable, Spectrum assumes no responsibility for the completeness or accuracy of the information contained herein.