



Safety Data Sheet

Material Name: N-Methyl-2-Pyrrolidone (NMP)

SDS ID: 89076

Section 1 - PRODUCT AND COMPANY IDENTIFICATION

Material Name

N-Methyl-2-Pyrrolidone (NMP)

Product Code

Not available

Synonyms

2-Pyrrolidinone, 1-methyl-; N-Methylpyrrolidinone; 1-Methyl pyrrolidinone; 1-Methylpyrrolidone; NMP

Product Use

Solvent. If this product is used in combination with other products, refer to the Safety Data Sheet for those products.

Restrictions on Use

None known.

Manufacturer Information

Clean Harbors Recycling Services of Chicago, LLC
1445 W. 42nd Street
Chicago, IL 60609
www.cleanharbors.com

Phone: 1-773-247-2828

Emergency # 1-800-645-8265

Issue Date

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Original Issue Date

June 17, 2009

Section 2 - HAZARDS IDENTIFICATION

Classification in accordance with paragraph (d) of 29 CFR 1910.1200.

Flammable Liquids - Category 4
Acute Toxicity - Inhalation - Dust/Mist - Category 4
Skin Corrosion/Irritation - Category 2
Serious Eye Damage/Eye Irritation - Category 2A
Reproductive Toxicity - Category 1B
Specific target organ toxicity - Single exposure - Category 3

GHS Label Elements

Symbol(s)



Signal Word

Danger

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Hazard Statement(s)

Combustible liquid.
Harmful if inhaled.
Causes skin irritation.
Causes serious eye irritation.
May damage fertility or the unborn child.
May cause respiratory irritation.

Precautionary Statement(s)

Prevention

Keep away from flames and hot surfaces. – No smoking. Wear protective gloves/protective clothing/eye protection/face protection. Avoid breathing dust, mist, fumes or vapors. Use only outdoors or in a well-ventilated area. Wash thoroughly after handling. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood.

Response

In case of fire: Use water spray, fog, or regular foam. IF exposed or concerned: Get medical advice/attention. IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER or doctor/physician if you feel unwell. IF ON SKIN: Wash with plenty of soap and water. If skin irritation occurs: Get medical advice/attention. Take off contaminated clothing and wash before reuse. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention. IF SWALLOWED: Get medical attention. Rinse mouth.

Storage

Store in a well-ventilated place. Keep container tightly closed. Keep cool. Store locked up.

Disposal

Dispose of in accordance with all applicable federal, state and local regulations.

Other Hazards

None known.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

CAS	Component Name	Percent
872-50-4	1-Methyl-2-pyrrolidone	99-100

Section 4 - FIRST AID MEASURES

Inhalation

IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER or doctor/physician if you feel unwell.

Skin

IF ON SKIN: Wash with plenty of soap and water. If skin irritation occurs: Get medical advice/attention. Take off contaminated clothing and wash before use.

Eyes

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists, get medical advice/attention.

Ingestion

IF SWALLOWED: Get medical attention. Rinse mouth.

Most Important Symptoms/Effects

Acute

Harmful if inhaled, respiratory tract irritation, skin irritation, eye irritation

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Delayed

Reproductive Effects

Indication of any immediate medical attention and special treatment needed

Treat symptomatically and supportively. Treatment may vary with condition of victim and specifics of incident. Call 1-800-645-8265 for additional information.

Section 5 - FIRE FIGHTING MEASURES

Extinguishing Media

Suitable Extinguishing Media

Use water spray, fog or regular foam. Carbon dioxide may be ineffective on larger fires due to a lack of cooling capacity which may result in re-ignition.

Unsuitable Extinguishing Media

Do not use high-pressure water streams.

Special Hazards Arising from the Chemical

Combustible liquid and vapor. Vapors are heavier than air and may travel along the ground to some distant source of ignition and flash back. Heated containers may rupture or be thrown into the air. Empty product containers may retain product residue and can be dangerous. Product may be sensitive to static discharge, which could result in fire or explosion.

Hazardous Combustion Products

Decomposition and combustion materials may be toxic. Potential decomposition gases have not been fully determined but may include: oxides of carbon, oxides of nitrogen

Fire Fighting Measures

Move container from fire area if it can be done without risk. Cool containers with water spray until well after the fire is out. Stay away from the ends of tanks. Cool containers with water from unmanned hose holder or monitor nozzles until well after fire is out. Do not scatter spilled material with high-pressure water streams. Apply water from a protected location or from a safe distance. Avoid inhalation of material or combustion by-products. Let the fire burn. Withdraw immediately in case of rising sound from venting safety device or any discoloration of tanks due to fire. For tank, rail car or tank truck, evacuation radius: 800 meters (1/2 mile). Stay upwind and keep out of low areas. Dike for later disposal.

Special Protective Equipment and Precautions for Firefighters

A positive-pressure, self-contained breathing apparatus (SCBA) and full-body protective equipment are required for fire emergencies.

Section 6 - ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures

Avoid breathing vapor or mist. Wear personal protective clothing and equipment, see Section 8.

Methods and Materials for Containment and Cleaning Up

Remove all ignition sources. Do not touch or walk through spilled product. Stop leak if you can do it without risk. Wear protective equipment and provide engineering controls as specified in SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Ventilate area and avoid breathing vapor or mist. A vapor suppressing foam may be used to reduce vapors. Contain spill away from surface water and sewers. Contain spill as a liquid for possible recovery, or sorb with compatible sorbent material and shovel with a clean, sparkproof tool into a sealable container for disposal. Minimum Personal Protective Equipment should be Level B: triple gloves (rubber gloves and nitrile gloves, over latex gloves) chemically resistant suit and boots, hard-hat, and Self Contained Breathing Apparatus. Spillage may cause SLIPPERY CONDITIONS (especially when wet).

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Section 7 - HANDLING AND STORAGE

Precautions for Safe Handling

Keep away from heat, sparks, or flame. Where flammable mixtures may be present, equipment safe for such locations should be used. Use clean, sparkproof tools and explosion-proof equipment. When transferring product, metal containers, including trucks and tank cars, should be grounded and bonded. Do not breathe vapor or mist. Use in a well ventilated area. Avoid contact with eyes Skin clothing shoes. Wash thoroughly after handling. Do not eat, drink, or smoke when using this product. Use Personal Protective equipment as required.

Conditions for Safe Storage, Including any Incompatibilities

Store in a well-ventilated place. Keep container tightly closed. Keep cool. Store locked up. Store in a dry place. Do not pressurize, cut, weld, braze, solder, drill, or grind containers. Keep containers away from heat, flame, sparks, static electricity, or other sources of ignition. Empty product containers may retain product residue and can be dangerous. See SECTION 14: TRANSPORTATION INFORMATION for Packing Group information.

Incompatible Materials

Oxidizing materials.

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

Component Exposure Limits

ACGIH, OSHA, and NIOSH have not developed exposure limits for any of this product's components.

ACGIH - Threshold Limit Values - Biological Exposure Indices (BEI)

1-Methyl-2-pyrrolidone (872-50-4)

100 mg/l Medium: urine Time: end of shift Parameter: 5-Hydroxy-N-methyl-2-pyrrolidone

Engineering Controls

Provide general ventilation. Where adequate general ventilation is unavailable, use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels.

Individual Protection Measures, such as Personal Protective Equipment

Eye/face protection

Wear safety glasses. Additional protection like goggles, face shields, or respirators may be needed dependent upon anticipated use and concentrations of mists or vapors. Eye wash fountain and emergency showers are recommended. Contact lens use is not recommended.

Skin Protection/Glove Recommendations

To avoid prolonged or repeated contact where spills and splashes are likely, wear appropriate chemical-resistant faceshield, boots, apron, whole body suits, or other protective clothing.

Respiratory Protection

No respiratory protection is normally required. Use NIOSH-certified P- or R- series particulate filter and organic vapor cartridges when concentration of vapor or mist exceeds applicable exposure limits. Protection provided by air purifying respirators is limited. Do not use N-rated respirators. Selection and use of respiratory protective equipment should be in accordance in the USA with OSHA General Industry Standard 29 CFR 1910.134; or in Canada with CSA Standard Z94.4.

Protective Materials

Personal protective equipment should be selected based upon the conditions under which this material is used. A hazard assessment of the work area for PPE requirements should be conducted by a qualified professional pursuant to regulatory requirements. The following PPE should be considered the minimum required. Safety glasses. Gloves. Lab coat or apron.

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Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Colorless to pale yellow liquid.	Physical State	Liquid
Odor	Ammonia-like.	Color	Colorless to pale yellow.
Odor Threshold	Not available	pH	Not available
Melting Point	-24 °C (-11 °F)	Boiling Point	202 °C (396 °F)
Boiling Point Range	Not available	Freezing point	Not available
Evaporation Rate	Not available.	Flammability (solid, gas)	Not available
Autoignition Temperature	346 °C (655 °F)	Flash Point	92.8°C [Closed Cup.](199 °F)
Lower Explosive Limit	1.3 vol%	Decomposition temperature	Not available
Upper Explosive Limit	9.5 vol%	Vapor Pressure	0.3 mmHg @ 68°F °C (20° C)
Vapor Density (air=1)	3.4 (Air = 1)	Specific Gravity (water=1)	1.026 (water = 1)
Water Solubility	Complete	Partition coefficient: n-octanol/water	Not available
Viscosity	Not available	Kinematic viscosity	Not available
Solubility (Other)	Complete	Coefficient of Water/Oil Dist	Not available
Density	8.55 lb/gal (US)	Physical Form	Liquid.
Volatile Organic Compounds (As regulated)	100 wt% (as per 40 CFR Part 51.100(s))		

Section 10 - STABILITY AND REACTIVITY

Reactivity

No reactivity hazard is expected.

Chemical Stability

Stable under normal temperatures and pressures. Contact with water or moist air may form ethanol.

Possibility of Hazardous Reactions

Polymerization is not known to occur under normal temperature and pressures. Not reactive with water.

Conditions to Avoid

Avoid heat, sparks, or flame. Avoid contact with incompatible materials.

Incompatible Materials

Reacts with water and moisture in air liberating ethanol.

Hazardous decomposition products

Not applicable under normal conditions of use and storage. See also SECTION 5: HAZARDOUS COMBUSTION PRODUCTS.

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Section 11 - TOXICOLOGICAL INFORMATION

Information on Likely Routes of Exposure

Inhalation

Harmful if inhaled. High concentrations of vapor or mist may irritate the respiratory tract (nose, throat, and lungs). High concentrations of vapor or mist may cause nausea, vomiting, headaches, dizziness, loss of coordination, numbness, and other central nervous system effects. Prolonged or repeated exposure may cause reproductive effects.

Skin Contact

May cause moderate irritation. Not likely to be absorbed in harmful amounts. Prolonged or repeated skin contact may cause drying, cracking, redness, itching, and/or swelling (dermatitis).

Eye Contact

Vapors may cause immediate or delayed severe eye irritation. Prolonged or repeated eye contact may cause inflammation of the membrane lining the eyelids and covering the eyeball (conjunctivitis).

Ingestion

May be harmful if swallowed. May cause, throat irritation, nausea, vomiting, central nervous system effects as noted for inhalation. Breathing product into the lungs during ingestion or vomiting may cause lung injury and possible death. Prolonged or repeated exposure may cause reproductive effects.

Acute and Chronic Toxicity

Component Analysis - LD50/LC50

The components of this material have been reviewed in various sources and the following selected endpoints are published:

1-Methyl-2-pyrrolidone (872-50-4)

Oral LD50 Rat 3914 mg/kg; Dermal LD50 Rabbit 8 g/kg; Inhalation LC50 Rat >5.1 mg/L 4 h

Product Toxicity Data

Acute Toxicity Estimate

No data available.

Immediate Effects

May be harmful if swallowed or inhaled. High concentrations of vapor or mist may cause nausea, vomiting, headaches, dizziness, loss of coordination, numbness, and other central nervous system effects. Irritating to eyes and respiratory system. Risk of serious damage to eyes. Also harmful: may cause lung damage if swallowed.

Delayed Effects

Based on best current information, there is no known human sensitization associated with this product.

Experimental evidence suggests that this product does not cause mutagenesis. N-Methyl-2-pyrrolidinone has demonstrated animal effects of reproductive toxicity. Also see SECTION 15: CALIFORNIA.

Irritation/Corrosivity Data

May cause respiratory tract irritation. May cause irritation of the skin and eyes.

Respiratory Sensitization

No information available for the product.

Dermal Sensitization

No information available for the product.

Component Carcinogenicity

None of this product's components are listed by ACGIH, IARC, NTP, DFG or OSHA.

Germ Cell Mutagenicity

Experimental evidence suggests that this product does not cause mutagenesis.

Tumorigenic Data

No data available

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Reproductive Toxicity

N-Methyl-2-pyrrolidinone has demonstrated animal effects of reproductive toxicity. N-Methyl-2-pyrrolidinone has demonstrated animal effects of teratogenicity.

Specific Target Organ Toxicity - Single Exposure

Respiratory system

Specific Target Organ Toxicity - Repeated Exposure

No target organs identified.

Aspiration hazard

No data available for this product.

Medical Conditions Aggravated by Exposure

Individuals with pre-existing respiratory tract (nose, throat, and lungs), central nervous system, eye, and/or skin disorders may have increased susceptibility to the effects of exposure.

Section 12 - ECOLOGICAL INFORMATION

Component Analysis - Aquatic Toxicity

1-Methyl-2-pyrrolidone	872-50-4
Fish:	LC50 96 h Lepomis macrochirus 832 mg/L [static]; LC50 96 h Pimephales promelas 1072 mg/L [static]; LC50 96 h Poecilia reticulata 1400 mg/L [static]
Algae:	EC50 72 h Desmodesmus subspicatus >500 mg/L IUCLID
Invertebrate:	EC50 48 h Daphnia magna 4897 mg/L IUCLID

Fish Toxicity

Not considered to be harmful to aquatic life.

Invertebrate Toxicity

No information available for the product.

Persistence and Degradability

No information available for the product.

Bioaccumulative Potential

No information available for the product.

Mobility

No information available for the product.

Other Toxicity

No information available for the product.

Section 13 - DISPOSAL CONSIDERATIONS

Disposal Methods

Dispose in accordance with all applicable federal, state/regional and local laws and regulations. Regulations may also apply to empty containers. The responsibility for proper waste disposal lies with the owner of the waste. Contact Clean Harbors regarding proper recycling or disposal.

Section 14 - TRANSPORT INFORMATION

DOT Non-Bulk Packages (≤119 gal): Not regulated for transport.

Bulk Packages: Shipping Name: Combustible liquid, n.o.s (Contains: 1-Methyl-2-pyrrolidone)

UN/NA #: NA1993 Hazard Class: 3 Packing Group: III

Required Label(s): Combustible liquid

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TDG Not regulated as dangerous goods.

International Bulk Chemical Code

This material contains one or more of the following chemicals required by the IBC Code to be identified as dangerous chemicals in bulk.

1-Methyl-2-pyrrolidone	872-50-4
IBC Code:	Category Y

Section 15 - REGULATORY INFORMATION

U.S. Federal Regulations

This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65), CERCLA (40 CFR 302.4), TSCA 12(b), and/or require an OSHA process safety plan.

1-Methyl-2-pyrrolidone	872-50-4
SARA 313:	1 % de minimis concentration
TSCA 12b:	Section 5 , 1 % de minimis concentration; Section 6 , 1 % de minimis concentration

Chemicals subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act (SARA) of 1986 and 40 CFR Part 372.

CAS-No.	Name	Percent by Weight
872-50-4	1-Methyl-2-pyrrolidone	99-100

SARA Section 311/312 (40 CFR 370 Subparts B and C) reporting categories

Flammable; Reproductive Toxicity; Skin Corrosion/Irritation; Serious Eye Damage/Eye Irritation; Specific Target Organ Toxicity

U.S. State Regulations

The following components appear on one or more of the following state hazardous substances lists:

Component	CAS	CA	MA	MN	NJ	PA
1-Methyl-2-pyrrolidone	872-50-4	No	Yes	Yes	Yes	Yes

California Safe Drinking Water and Toxic Enforcement Act (Proposition 65)

WARNING! This product can expose you to chemicals including 1-Methyl-2-pyrrolidone , which is known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

1-Methyl-2-pyrrolidone	872-50-4
Repro/Dev. Tox	developmental toxicity , 6/15/2001

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Component Analysis - Inventory

1-Methyl-2-pyrrolidone (872-50-4)

US	CA	AU	CN	EU	JP - ENCS	JP - ISHL	KR KECI - Annex 1	KR KECI - Annex 2
Yes	DSL	Yes	Yes	EIN	Yes	Yes	Yes	No
KR - REACH CCA			MX	NZ	PH	TH-TECI	TW	VN (Draft)
Yes			Yes	Yes	Yes	Yes	Yes	Yes

Section 16 - OTHER INFORMATION

NFPA Ratings

Health: 2 Fire: 2 Instability: 0

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

Summary of Changes

Regulatory review and update.

Key / Legend

ACGIH - American Conference of Governmental Industrial Hygienists; ADR - European Road Transport; AU - Australia; BOD - Biochemical Oxygen Demand; C - Celsius; CA - Canada; CA/MA/MN/NJ/PA - California/Massachusetts/Minnesota/New Jersey/Pennsylvania*; CAS - Chemical Abstracts Service; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CFR - Code of Federal Regulations (US); CLP - Classification, Labelling, and Packaging; CN - China; CPR - Controlled Products Regulations; DFG - Deutsche Forschungsgemeinschaft; DOT - Department of Transportation; DSD - Dangerous Substance Directive; DSL - Domestic Substances List; EC - European Commission; EEC - European Economic Community; EIN - European Inventory of (Existing Commercial Chemical Substances); EINECS - European Inventory of Existing Commercial Chemical Substances; ENCS - Japan Existing and New Chemical Substance Inventory; EPA - Environmental Protection Agency; EU - European Union; F - Fahrenheit; F - Background (for Venezuela Biological Exposure Indices); IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; ICAO - International Civil Aviation Organization; IDL - Ingredient Disclosure List; IDLH - Immediately Dangerous to Life and Health; IMDG - International Maritime Dangerous Goods; ISHL - Japan Industrial Safety and Health Law; IUCLID - International Uniform Chemical Information Database; JP - Japan; Kow - Octanol/water partition coefficient; KR KECI Annex 1 - Korea Existing Chemicals Inventory (KECI) / Korea Existing Chemicals List (KECL); KR KECI Annex 2 - Korea Existing Chemicals Inventory (KECI) / Korea Existing Chemicals List (KECL), KR - Korea; LD50/LC50 - Lethal Dose/ Lethal Concentration; KR REACH CCA - Korea Registration and Evaluation of Chemical Substances Chemical Control Act; LEL - Lower Explosive Limit; LLV - Level Limit Value; LOLI - List Of Lists™ - ChemADVISOR's Regulatory Database; MAK - Maximum Concentration Value in the Workplace; MEL - Maximum Exposure Limits; MX - Mexico; Ne - Non-specific; NFPA - National Fire Protection Agency; NIOSH - National Institute for Occupational Safety and Health; NJTSR - New Jersey Trade Secret Registry; Nq - Non-quantitative; NSL - Non-Domestic Substance List (Canada); NTP - National Toxicology Program; NZ - New Zealand; OSHA - Occupational

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Safety and Health Administration; PEL- Permissible Exposure Limit; PH - Philippines; RCRA - Resource Conservation and Recovery Act; REACH- Registration, Evaluation, Authorisation, and restriction of Chemicals; RID - European Rail Transport; SARA - Superfund Amendments and Reauthorization Act; Sc - Semi-quantitative; STEL - Short-term Exposure Limit; TCCA – Korea Toxic Chemicals Control Act; TDG - Transportation of Dangerous Goods; TH-TECI - Thailand - FDA Existing Chemicals Inventory (TECI); TLV - Threshold Limit Value; TSCA - Toxic Substances Control Act; TW – Taiwan; TWA - Time Weighted Average; UEL - Upper Explosive Limit; UN/NA - United Nations /North American; US - United States; VLE - Exposure Limit Value (Mexico); VN (Draft) - Vietnam (Draft); WHMIS - Workplace Hazardous Materials Information System (Canada).

Other Information

Disclaimer:

User assumes all risks incident to the use of this product. To the best of our knowledge, the information contained herein is accurate. However, Clean Harbors assumes no liability whatsoever for the accuracy or completeness of the information contained herein. No representations or warranties, either expressed or implied, of merchantability, fitness for a particular purpose or of any other nature are made hereunder with respect to the information or the product to which the information refers. The data contained on this sheet apply to the product as supplied to the user.