

N METHYL PYRROLIDONE

Version 1.5

Revision Date 03/05/2015

Print Date 03/26/2015

SDS No.: BE1006

SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Product name : N METHYL PYRROLIDONE
CAS Number: 872-50-4
Chemical characterization : Cyclic Amide
Chemical Name : N-Methyl-2-pyrrolidinone
Synonyms : 2-Pyrrolidinone, 1-methyl-, NMP

Identified uses : Solvent

Prohibited uses : Cosmetics; Toiletries; Personal care products; Carrier solvent for veterinary drugs; Pharmaceutical excipient

Company : Lyondell Chemical Company
LyondellBasell Tower, Suite 300
1221 McKinney St.
P.O. Box 2583
Houston Texas 77252-2583

Telephone : Customer Service 888 777-0232
Product Safety 800 700-0946

Emergency telephone : CHEMTREC USA 800-424-9300
LYONDELL 800-245-4532

E-mail address : product.safety@lyb.com

SECTION 2. HAZARDS IDENTIFICATION**GHS Classification**

Flammable Liquids	Category 4
Eye irritation	Category 2A
Reproductive toxicity	Category 1B
Specific target organ systemic toxicity - single exposure	Category 3

GHS Classification Scale (1= severe hazard; 4= slight hazard)

Label elements

Hazard symbols : 

Signal Word : Danger

Hazard Statements : H227 Combustible liquid.
H319 Causes serious eye irritation.
H335 May cause respiratory irritation.
H336 May cause drowsiness or dizziness.
H360 May damage fertility or the unborn child.

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Precautionary Statements**: Prevention**

P201 Obtain special instructions before use.
P210 Keep away from heat/sparks/open flames/hot surfaces.
- No smoking.
P261 Avoid breathing dust/ fume/ gas/ mist/ vapors/ spray.
P264 Wash hands thoroughly after handling.
P271 Use only outdoors or in a well-ventilated area.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response

P370 + P378 In case of fire: Use dry chemical, carbon dioxide, water spray, or alcohol-resistant foam.
P304 + P340 + P312 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or doctor/ physician if you feel unwell.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337 + P313 If eye irritation persists: Get medical advice/ attention.
P308 + P313 IF exposed or concerned: Get medical advice/ attention.

Storage

P403 + P233 Store in a well-ventilated place. Keep container tightly closed.
P235 Keep cool.

Other hazards

No additional information available.

3. Composition/information on ingredients**Substances****Ingredients**

Chemical Name	CAS-No. EC-No.	Weight %	Component Type
N-Methyl Pyrrolidone	872-50-4	>= 99.0 %	A

Key:
(A) Substance

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SECTION 4. FIRST AID MEASURES**First aid procedures**

- General advice : Always observe self-protection methods
Wear appropriate personal protective equipment, avoid direct contact.
Move out of dangerous area.
Remove contaminated shoes and clothing.
Get medical attention immediately.
Show this material safety data sheet to the doctor in attendance.
- If inhaled : Remove victim to fresh air and keep at rest in a position comfortable for breathing.
Do not leave the victim unattended.
Immediately seek medical attention.
Keep patient warm and at rest.
If breathing is difficult, give oxygen.
If unconscious place in recovery position and seek medical advice.
In the event of unconsciousness, apnea or cardiac arrest (no pulse), apply cardiopulmonary resuscitation.
- In case of skin contact : Appears to be readily absorbed through the skin but no systemic toxicity is expected from acute dermal exposure.
Take off contaminated clothing and shoes immediately.
In case of contact, immediately flush skin with soap and plenty of water.
Seek medical attention if ill effect or irritation develops.
Wash contaminated clothing before reuse.
- In case of eye contact : In case of eye contact, remove contact lens and rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes.
Get medical attention immediately if irritation persists.
- If swallowed : If victim is drowsy or unconscious, place on the left side with head down.
If victim is conscious and able to swallow, have victim drink water to dilute. Never give anything by mouth if victim is unconscious or having convulsions. This product poses a possible lung aspiration hazard if it is ingested. Induce vomiting only if advised by physician or Poison Control Center. CALL A PHYSICIAN OR POISON CONTROL CENTER IMMEDIATELY!
If vomiting does occur, have victim lean forward to reduce risk of aspiration.

Notes to physician

- Hazards : This product may cause eye, skin, and respiratory tract irritation. High concentrations may cause central nervous system (CNS) depression. Ingestion would likely cause

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gastrointestinal tract irritation.
Skin absorption hazard.

Treatment : Treat symptomatically.
Treatment of overexposure should be directed at the control of symptoms and the clinical condition of the patient.
There is no specific antidote.
Potential danger from aspiration must be weighed against possible oral toxicity when deciding to induce vomiting.

SECTION 5. FIRE-FIGHTING MEASURES**Flammable properties**

Flash point : 196 °F (91 °C)
at 1,013 hPa (760 mm Hg)
Method: closed cup

Autoignition temperature : 473 °F (245 °C)
at 1,013 hPa (760 mm Hg)

Lower explosion limit : ~1.3 vol%

Upper explosion limit : ~9.5 vol%

Flammability (solid, gas) : Not applicable

Fire fighting

Suitable extinguishing media : SMALL FIRE: Use dry chemical, CO₂, water spray or regular foam. LARGE FIRE: Use water spray, water fog or regular foam. Do not use straight streams.

Unsuitable extinguishing media : Do not use solid water stream.

Protective equipment and precautions for firefighters

Specific hazards during fire fighting : When heated above the flash point, releases flammable vapors.
When mixed with air and exposed to ignition source, vapors can burn in open or explode if confined.
Vapors may be heavier than air.
May travel long distances along the ground before igniting and flashing back to vapor source.
Fine sprays/mists may be combustible at temperatures below normal flash point.
Move containers from fire area if it can be done without risk.
Fight fire from maximum distance or use unmanned hose holders or monitor nozzles.
Heat may build enough pressure to rupture closed containers/spreading fire/increasing risk of burns/injuries.
Cool containers with flooding quantities of water until well after

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fire is out.

Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.

Always stay away from tanks engulfed in fire.

For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

Do not allow run-off from fire fighting to enter drains or water courses.

Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.

Special protective equipment for fire-fighters : Wear positive pressure self-contained breathing apparatus (SCBA).
Structural firefighter's protective clothing will only provide limited protection.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions : Clean-up to be performed only by trained and properly equipped personnel.
Wear recommended personal protective equipment.
Ensure adequate ventilation.
Evacuate personnel to safe areas.

Environmental precautions : Prevent entry into waterways, sewers, basements or confined areas.
If the product contaminates rivers and lakes or drains inform respective authorities.
If necessary, all contaminated waste water must be treated in a municipal or industrial wastewater treatment plant before release to surface water.

Chemical removal by air and water pollution control devices must meet the minimum efficiency requirements needed to reduce exposures to an acceptable level.
The discharge of treatment plant effluent to rivers and oceans must achieve the dilution ratio needed to reduce exposures to an acceptable level.
The size and capacity of wastewater treatment plants must meet the minimum requirements needed to reduce exposures to an acceptable level.
Waste management practices such as incineration, recycling, reuse must be enforced as needed to reduce exposures to an acceptable level.

External treatment and disposal of waste should comply with applicable local and/or national regulations.
The maximum allowable site tonnage and the days of use should be below the number needed to maintain exposures at an acceptable level.

Methods for containment / Methods for cleaning up : Combustible liquid.
Eliminate all sources of ignition.

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All equipment used when handling this product must be grounded.
 Do not touch or walk through spilled material.
 Stop leak if you can do it without risk.
 A vapor suppressing foam may be used to reduce vapors.
 Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers.
 Use clean non-sparking tools to collect absorbed material.
 Dike large spills and place materials in salvage containers.
 Water spray may reduce vapor; but may not prevent ignition in closed spaces.
 Treat all waste as hazardous and dispose using licenced waste removal company.

SECTION 7. HANDLING AND STORAGE**Handling**

Advice on safe handling : Use only in area provided with appropriate exhaust ventilation. Handle empty containers with care - residue may be combustible and burn if exposed to heat/sparks/open flame. In addition to the fire/explosion hazard, residual vapor and liquid may also be toxic.
 Keep container tightly closed when not in use.
 Keep away from heat and sources of ignition.
 Isolate, vent, drain, wash and purge systems or equipment before maintenance or repair.
 Wear recommended personal protective equipment.
 Avoid contact with incompatible agents.
 Observe precautions pertaining to confined space entry.

Advice on protection against fire and explosion : Keep away from heat and sources of ignition.

Storage

Requirements for storage areas and containers : Mild or stainless steel.
 Store away from heat, sparks, open flames, strong oxidizing agents and direct sunlight.
 Keep container tightly closed and properly labeled.

8. Exposure controls/personal protection**Control parameters****Ingredients with workplace control parameters**

Consult local authorities for acceptable exposure limits.

Biological Exposure Indices

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Ingredients	CAS-No.	Control parameters	Biological specimen	Sampling time	Concentration	Basis
N-Methyl Pyrrolidone	872-50-4	5-Hydroxy-N-methyl-2-pyrrolidone	urine	end of shift	100 mg/l	ACGIH_BEL S

Exposure controls**Engineering measures**

At elevated temperatures, special ventilation may be required even if the flash point has not been exceeded.

Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits.

Personal protective equipment

Respiratory protection : No occupational exposure limits have been developed for this material.

: When workers are facing concentrations above the exposure limit they must use appropriate certified respirators.

Hand protection : Use chemical resistant gloves appropriate to conditions of use.

Wear chemical resistant gloves such as:

Butyl rubber.

Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough.

Eye and face protection : Eye protection, including both chemical splash goggles and face shield, must be worn when possibility exists for eye contact due to splashing/spraying liquid, airborne particles, or vapor.

Skin and body protection : When skin contact is possible, protective clothing including gloves, apron, sleeves, boots, head and face protection should be worn.

Choose body protection according to the amount and concentration of the dangerous substance at the work place.

Use PPE that is chemical resistant to the product and prevents skin contact.

Hygiene measures : Selection of appropriate personal protective equipment should be based on an evaluation of the performance characteristics of the protective equipment relative to the task(s) to be performed, conditions present, duration of use, and the hazards and/or potential hazards that may be encountered during use.

Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure.

Use good personal hygiene practices.

Wash hands before eating, drinking, smoking, or using toilet facilities.

Take off contaminated clothing and wash before reuse.

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SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES**Appearance**

Physical state : liquid

Color : Clear, colorless.

Odor : Amine-like odor.

Safety data

Flash point : 196 °F (91 °C)
at 1,013 hPa (760 mm Hg)
Method: closed cup

Lower explosion limit : ~1.3 vol%

Upper explosion limit : ~9.5 vol%

Flammability (solid, gas) : Not applicable

Oxidizing properties : The substance or mixture is not classified as oxidizing.

Autoignition temperature : 473 °F (245 °C)
at 1,013 hPa (760 mm Hg)

Decomposition temperature : not determined

pH : no data available

Melting point/range : -11.6 °F (-24.2 °C)
at 1,013 hPa (760 mm Hg)

Boiling point/boiling range : 399 °F (204 °C)
at 1,013 hPa (760 mm Hg)

Vapor pressure : 0.32 hPa (0.24 mm Hg)
at 68 °F (20 °C)

Density : 1.03 g/cm³
at 77 °F (25 °C)

Water solubility : 1,000 g/l
at 68 °F (20 °C)
completely miscible

Partition coefficient: n-
octanol/water : log Pow: -0.46
at 77 °F (25 °C)

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Viscosity, dynamic	: 1.661 mPa.s at 77 °F (25 °C)
Relative vapor density	: ~3.4 at 59.9 - 90.0 °F (15.5 - 32.2 °C) (Air = 1.0)
Explosive properties	: Not applicable
Remarks - Other information	: hygroscopic

SECTION 10. STABILITY AND REACTIVITY

Reactivity	: Not classified as a reactivity hazard.
Chemical stability	: Stable under recommended storage conditions.
Conditions to avoid	: In contact with moisture, this hygroscopic (i.e., absorbs water from the air) material may degrade or become contaminated. Heat, sparks, open flame, other ignition sources, and oxidizing conditions.
Materials to avoid	: Strong oxidizing agents. Strong reducing agent. Moisture and humidity.
Hazardous decomposition products	: Carbon monoxide and nitrogen oxide fumes emitted when heated to decomposition.
Thermal decomposition	: Incomplete combustion may produce carbon monoxide, oxides or compounds of nitrogen and other toxic gases.
Hazardous reactions	: Not expected to occur. Stable.

SECTION 11. TOXICOLOGICAL INFORMATION

Product Summary	: The below given information is based on the assessment of the product including impurities.
Acute toxicity	
Acute oral toxicity	: Based on acute toxicity values, not classified. Ingestion may cause discomfort and irritation of the gastrointestinal tract.
	: LD50 Oral: 4,150 mg/kg

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Species: Rat

Acute inhalation toxicity : Based on acute toxicity values, not classified.: LC50: > 5.1 mg/l
Exposure time: 4 HOURS
Species: Rat**Acute dermal toxicity** : Based on acute toxicity values, not classified.: LD50: > 5,000 mg/kg
Species: Rat**Skin corrosion/irritation** : Not classified
May cause mild skin irritation**Serious eye damage/eye irritation** : Classified
Causes serious eye irritation.**Respiratory or skin sensitization** : Skin sensitization
Based on skin sensitization values, not classified.: Respiratory sensitization
Not classified
no data available**Chronic toxicity**Carcinogenicity : Not classified
This product has had a positive finding in a carcinogenic investigation. The findings do not appear to be relevant to classification due to the non genotoxic mechanism and the species sensitivity to the liver tumors observed.Germ cell mutagenicity : Not classified
No adverse effect observed.**Reproductive toxicity**Effects on fertility /
Effects on or via lactation : Not classified
No adverse effect observed.Effects on Development : Classified
May damage the unborn child.

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Target Organ Systemic Toxicant - Single exposure	: Classified, May cause respiratory irritation., May cause drowsiness or dizziness.
	: Routes of exposure: Inhalation Target Organs: Respiratory system
Target Organ Systemic Toxicant - Repeated exposure	: Based on repeated exposure toxicity values, not classified.
Aspiration hazard	: Based on physico-chemical values or lack of human evidence, not classified.

12. ECOLOGICAL INFORMATION**Ecotoxicology Assessment**

Acute aquatic toxicity	: Based on acute aquatic toxicity values, not classified.
Chronic aquatic toxicity	: Not classified, based on readily biodegradability and low acute toxicity.
Toxicity to fish	: Acute toxicity to fish is very low.
Toxicity to daphnia and other aquatic invertebrates	: Low acute toxicity to aquatic invertebrates.
Toxicity to algae	: Low toxicity to algae.
Toxicity to bacteria	: Low toxicity to sewage microbes.
Toxicity to fish (Chronic toxicity)	: no data available study scientifically unjustified
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	: Low chronic toxicity to aquatic invertebrates.

Persistence and degradability

Biodegradability	: Readily biodegradable
	: BOD (Modified MITI Method) = 73% (28 days).

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Bioaccumulative potential**Bioaccumulation** : Not expected to bioaccumulate in aquatic organisms.**Mobility in soil****Distribution among environmental compartments** : Stability in soil
no data available
Low potential for soil adsorption expected: Stability in water
Hydrolysis expected to be very slow.
Half-life >1 year
(QSAR calculated value)**Additional advice Environmental fate and pathways** : No additional information available.**Results of PBT and vPvB assessment**

Not applicable.

Other adverse effects**Additional ecological information** : No additional information available.**SECTION 13. DISPOSAL CONSIDERATIONS****Further information** : Dispose of as hazardous waste in compliance with local and national regulations.
The product should not be allowed to enter drains, water courses or the soil.
Incinerate concentrated liquids in compliance with local, state or international regulations.
Contaminated product, soil, water, container residues and spill cleanup materials may be hazardous wastes.
Comply with applicable local, state or international regulations concerning solid or hazardous waste disposal and/or container disposal.**Contaminated packaging** : Empty remaining contents.
Dispose of as unused product.
Do not re-use empty containers.
Do not burn, or use a cutting torch on, the empty drum.**SECTION 14. TRANSPORT INFORMATION****DOT UN number** : NA1993

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Description of the goods : COMBUSTIBLE LIQUID, N.O.S.
 : (N-METHYL PYRROLIDONE)
 Class : 0
 Labels : NON

SECTION 15. REGULATORY INFORMATION**SARA 302/304**

This product contains no known chemicals regulated under SARA 302/304.

SARA 311/312

Based upon available information, this material is classified as the following health and/or physical hazards according to Section 311 & 312:

Immediate (Acute) Health Hazard.
 Fire Hazard.

SARA 313

This product contains the following chemicals subject to the reporting requirements of SARA Title III, Section 313 and 40 CFR 372:

<u>Component</u>	<u>Reporting Threshold</u>
N-Methyl Pyrrolidone	1.0%

State Reporting

This material may contain trace levels of the following chemical substance(s) regulated under California Proposition 65. However, LyondellBasell has not tested for the presence of listed chemical substances. It is the responsibility of the California business owner to develop his or her own regulatory compliance plan. Contact Product Safety for further information at product.safety@lyb.com.

Substance	CASRN	Type of Toxicity			
		Carcinogen	Developmental	Repro-Male	Repro-Female
N-Methyl Pyrrolidone	872-50-4		X		

This product contains the following chemicals regulated by New Jersey's Worker and Community Right to Know Act:

872-50-4 N-Methyl Pyrrolidone

This product contains the following chemicals regulated by Massachusetts' Right to Know Law:

872-50-4 N-Methyl Pyrrolidone

This product contains the following chemicals regulated by Pennsylvania's Right to Know Act:

872-50-4 N-Methyl Pyrrolidone

Other international regulations**Global Inventory Status**

The ingredients of this product are compliant with the following chemical inventory requirements or exemptions.

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*Additional Explanatory Status Statements follow the table, as necessary.

Country/Region	Inventory	Status Description
Australia	AICS	Compliant
Canada	DSL	Compliant
China	IECSC	Compliant
Europe	REACH	See REACH Compliance Statement
Japan	ENCS	Compliant
Korea	KECI	Compliant
New Zealand	NZIoC	Compliant
Philippines	PICCS	Compliant
United States of America	TSCA	Compliant
Taiwan	TCSCA	Compliant

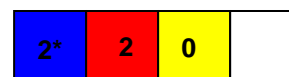
REACH status

If the product has been purchased from any company of the LyondellBasell group of companies registered in the European Union, we confirm that the chemical substance in this product has been pre-registered or, where required under REACH, registered, and that we have the intention to proceed with any required registration in accordance with the deadlines set forth in REACH. (Regulation (EU) No. 1907/2006)

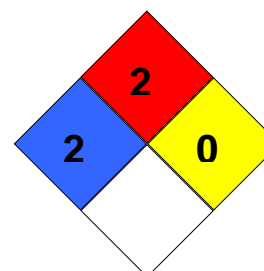
Contact product.safety@lyb.com for additional global inventory information.

SECTION 16. OTHER INFORMATION**Further information****HMIS Classification**

: Health Hazard: 2
 Chronic Health Hazard: *
 Flammability: 2
 Physical hazards: 0

**NFPA Classification**

: Health Hazard: 2
 Fire Hazard: 2
 Instability: 0

**Material safety datasheet sections which have been updated:**

Revised Section(s): 1 9 10 11 15 March 5 2015

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Disclaimer

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Information is correct to the best of our knowledge at the date of the SDS publication.

It is not a specification sheet nor should any displayed data be construed as a specification.

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This product(s) may not be used in:

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