



SAFETY DATA SHEET
N-METHYL-2-PYRROLIDINONE (NMP)
REVISION 5, DATE 29 APR 20

1. IDENTIFICATION

Product Name	N-methyl-2-pyrrolidinone (NMP)
Other Names	No Data Available
Uses	Industrial solvent.
Chemical Family	No Data Available
Chemical Formula	C ₅ H ₉ NO
Chemical Name	2-Pyrrolidinone, 1-methyl-
Product Description	No Data Available

Contact Details of the Supplier of this Safety Data Sheet

Organisation	Location	Telephone
Redox Ltd	2 Swettenham Road Minto NSW 2566 Australia	+61-2-97333000
Redox Ltd	11 Mayo Road Wiri Auckland 2104 New Zealand	+64-9-2506222
Redox Inc.	3960 Paramount Boulevard Suite 107 Lakewood CA 90712 USA	+1-424-675-3200
Redox Chemicals Sdn Bhd	Level 2, No. 8, Jalan Sapir 33/7 Seksyen 33, Shah Alam Premier Industrial Park 40400 Shah Alam Sengalor, Malaysia	+60-3-5614-2111

Emergency Contact Details

For emergencies only; DO NOT contact these companies for general product advice.

Organisation	Location	Telephone
Poisons Information Centre	Westmead NSW	1800-251525 131126
Chemcall	Australia	1800-127406 +64-4-9179888
Chemcall	Malaysia	+64-4-9179888
Chemcall	New Zealand	0800-243622 +64-4-9179888
National Poisons Centre	New Zealand	0800-764766
CHEMTREC	USA & Canada	1-800-424-9300 CN723420 +1-703-527-3887

2. HAZARD IDENTIFICATION

Poisons Schedule (Aust)

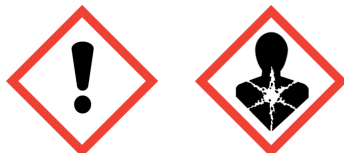
Schedule 6



Globally Harmonised System

Hazard Classification Hazardous according to the criteria of the Globally Harmonised System of Classification and Labelling of Chemicals (GHS)

Hazard Categories Flammable Liquids - Category 4
Skin Corrosion/Irritation - Category 2
Serious Eye Damage/Irritation - Category 2A
Toxic To Reproduction - Category 1B
Specific Target Organ Toxicity (Single Exposure) - Category 3

Pictograms

Signal Word Danger

Hazard Statements

H227	Combustible liquid.
H315	Causes skin irritation.
H319	Causes serious eye irritation.
H335	May cause respiratory irritation.
H360D	May damage the unborn child.

Precautionary Statements	Prevention	P201	Obtain special instructions before use.
		P271	Use only outdoors or in a well-ventilated area.
		P280	Wear protective gloves/protective clothing/eye protection/face protection.
		P261	Avoid breathing fumes/mists/vapours/spray.
		P210	Keep away from flames and hot surfaces. No smoking.
		P235	Keep cool.
	Response	P302 + P352	IF ON SKIN: Wash with plenty of water.
		P304 + P340	IF INHALED: Remove victim to fresh air and keep comfortable for breathing.
		P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
		P308 + P313	IF exposed or concerned: Get medical attention.
		P312	Call a POISON CENTER or doctor if you feel unwell.
		P332 + P313	If skin irritation occurs: Get medical attention.
		P337 + P313	If eye irritation persists: Get medical attention.
		P362	Take off contaminated clothing.
		P370 + P378	In case of fire: Use carbon dioxide (CO2), dry chemical, foam or water mist for extinction.
		Storage	P403 + P233
	P405		Store locked up.
	Disposal	P501	Dispose of contents/container in accordance with local / regional / national / international regulations.

National Transport Commission (Australia)

Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)

Dangerous Goods Classification NOT Dangerous Goods according to the criteria of the Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)

3. COMPOSITION/INFORMATION ON INGREDIENTS*Ingredients*

Chemical Entity	Formula	CAS Number	Proportion
N-methyl-2-pyrrolidone	C5H9NO	872-50-4	<=100 %

4. FIRST AID MEASURES*Description of necessary measures according to routes of exposure*

Swallowed	IF SWALLOWED: Rinse mouth, then drink a glass of water. Do NOT induce vomiting. Call a Poison Centre or doctor/physician for advice. Never give anything by mouth to an unconscious person.
Eye	IF IN EYES: Do not rub eyes. Immediately flush eyes with running water for several minutes, holding eyelids open and occasionally lifting the upper and lower lids. Remove contact lenses if present and easy to do. Continue flushing until advised to stop by a Poisons Information Centre or a doctor, or for at least 15 minutes.
Skin	IF ON SKIN (or hair): Remove and isolate contaminated clothing and shoes. Immediately flush skin and hair with running water for at least 15 minutes. Get medical advice/attention. Wash contaminated clothing and shoes before reuse.
Inhaled	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a Poison Centre or doctor/physician for advice. Give artificial respiration if victim is not breathing. Administer oxygen if breathing is difficult.
Advice to Doctor	If exposed or concerned, get medical advice/attention. Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
Medical Conditions Aggravated by Exposure	No information available.

5. FIRE FIGHTING MEASURES

General Measures	If safe to do so, move undamaged containers from fire area. Cool containers with water spray until well after fire is out.
Flammability Conditions	Combustible liquid; may burn but does not ignite readily.
Extinguishing Media	Use dry chemical, Carbon dioxide (CO2), alcohol-resistant foam or water spray for extinction - Do not use water jets.
Fire and Explosion Hazard	Containers may explode when heated. May emit flammable vapour if involved in fire.
Hazardous Products of Combustion	Fire may produce irritating, toxic and/or corrosive fumes, including Carbon oxides, Nitrogen oxides.
Special Fire Fighting Instructions	Contain runoff from fire control or dilution water - Runoff may pollute waterways.
Personal Protective Equipment	Wear positive pressure self-contained breathing apparatus (SCBA). Structural firefighters' protective clothing will only provide limited protection.
Flash Point	91 - 93 °C [Closed cup]
Lower Explosion Limit	0.99 %
Upper Explosion Limit	3.9 %
Auto Ignition Temperature	270 °C
Hazchem Code	No Data Available

6. ACCIDENTAL RELEASE MEASURES

General Response Procedure	Ensure adequate ventilation. ELIMINATE all ignition sources. Do not touch or walk through spilled material. Avoid breathing vapours and contact with eyes, skin and clothing.
Clean Up Procedures	Absorb with earth, sand or other non-combustible material and transfer to a suitable container for disposal (see SECTION 13).
Containment	Stop leak if safe to do so – Prevent entry into waterways, drains or confined areas.
Decontamination	Ventilate area and wash spill site after material pick-up is complete.
Environmental Precautionary Measures	Prevent entry into drains and waterways.
Evacuation Criteria	Spill or leak area should be isolated immediately. Keep unauthorised personnel away.
Personal Precautionary Measures	Use personal protective equipment as required (see SECTION 8).

7. HANDLING AND STORAGE

Handling	Safety showers and eyewash facilities should be provided within the immediate work area for emergency use. Ensure adequate ventilation - Use only outdoors or in a well-ventilated area. Obtain special instructions before use - Do not handle until all safety precautions have been read and understood. Avoid breathing mist/vapours/spray and contact with eyes, skin and clothing. Do not ingest. Use personal protective equipment as required (see SECTION 8). Keep away from heat, hot surfaces, sparks, open flames and other ignition sources - No smoking. Take precautionary measures against static discharge.
Storage	Store in a cool, dry and well-ventilated place, out of direct sunlight. Keep container tightly closed. Keep cool; Keep away from heat, hot surfaces, sparks, open flames and other ignition sources - No smoking. Keep away from foodstuffs and incompatible materials (see SECTION 10). Store locked up. *Storage place should be equipped with appropriate fire fighting equipment and leakage emergency equipment.
Container	Keep in the original container. *Do not expose empty containers to heat, sparks, open flames or other ignition sources.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

General	For 1-Methyl-2-pyrrolidone (CAS No. 872-50-4): - Safe Work Australia Exposure Standard: TWA = 25 ppm (103 mg/m ³); STEL = 75 ppm (309 mg/m ³); Absorption through the skin may be a significant source of exposure (Sk). - New Zealand Workplace Exposure Standard [Next review 2022]: TWA = 25 ppm (103 mg/m ³); STEL = 75 ppm (309 mg/m ³); Skin absorption (skin).
Exposure Limits	No Data Available
Biological Limits	No information available.
Engineering Measures	A system of local and/or general exhaust is recommended to keep employee exposures as low as possible. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area.
Personal Protection Equipment	- Respiratory protection: Wear respiratory protection in case of inadequate ventilation, under conditions of frequent use or heavy exposure. Recommended: Organic vapour/particulate filter respirator or supplied-air respirator (refer to AS/NZS 1715 & 1716). - Eye/face protection: Wear appropriate eye protection to avoid eye contact. Recommended: Primary protection chemical goggles with secondary protection face-shield. - Hand protection: Wear protective gloves. Recommended: Compatible protective gloves. - Skin/body protection: Wear appropriate personal protective clothing to avoid skin contact. Recommended: Wear anti-electrostatic clothing.
Special Hazards Precautions	No information available.
Work Hygienic Practices	Handle in accordance with good industrial hygiene and safety practice. Do not eat, drink or smoke when using this product. Wash skin thoroughly after handling. Take off contaminated clothing and wash it before reuse.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State	Liquid
Appearance	Transparent liquid
Odour	Weak, Amine
Colour	Colourless
pH	7.7 - 8.0 (10% soln.)
Vapour Pressure	0.345 mmHg (@ 25)
Relative Vapour Density	3.4 Air = 1
Boiling Point	202 °C
Melting Point	-24 °C
Freezing Point	-24 °C
Solubility	Miscible with water
Specific Gravity	1.03
Flash Point	91 - 93 °C [Closed cup]
Auto Ignition Temp	270 °C
Evaporation Rate	~0.03 (Butyl acetate = 1)
Bulk Density	No Data Available
Corrosion Rate	No Data Available
Decomposition Temperature	No Data Available
Density	No Data Available
Specific Heat	No Data Available
Molecular Weight	99.13 g/mol
Net Propellant Weight	No Data Available
Octanol Water Coefficient	-0.38
Particle Size	No Data Available
Partition Coefficient	No Data Available
Saturated Vapour Concentration	No Data Available
Vapour Temperature	No Data Available
Viscosity	No Data Available
Volatile Percent	No Data Available
VOC Volume	No Data Available
Additional Characteristics	No information available.
Potential for Dust Explosion	Not applicable.
Fast or Intensely Burning Characteristics	No information available.
Flame Propagation or Burning Rate of Solid Materials	No information available.
Non-Flammables That Could Contribute Unusual Hazards to a Fire	No information available.
Properties That May Initiate or Contribute to Fire Intensity	Combustible liquid; may burn but does not ignite readily.
Reactions That Release Gases or Vapours	Fire/decomposition may produce irritating, toxic and/or corrosive fumes, including Carbon oxides, Nitrogen oxides.
Release of Invisible Flammable Vapours and Gases	May emit flammable vapour if involved in fire.

10. STABILITY AND REACTIVITY

General Information	No information available.
Chemical Stability	This material is stable under recommended storage and handling conditions.
Conditions to Avoid	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. Take precautionary measures against static discharge.
Materials to Avoid	Incompatible/reactive with strong oxidising agents, strong reducing agents, strong acids, strong bases and combustible materials.
Hazardous Decomposition Products	Fire/decomposition may produce irritating, toxic and/or corrosive fumes, including Carbon oxides, Nitrogen oxides. May emit flammable vapour if involved in fire.
Hazardous Polymerisation	Will not occur.

11. TOXICOLOGICAL INFORMATION

General Information	<ul style="list-style-type: none"> - Acute toxicity: Low acute toxicity. - Skin corrosion/irritation: Causes skin irritation. - Eye damage/irritation: Causes serious eye irritation. - Respiratory/skin sensitisation: No evidence of sensitisation [NICNAS]. - Germ cell mutagenicity: Not considered to be genotoxic [NICNAS]. - Carcinogenicity: No evidence of carcinogenicity [NICNAS]. - Reproductive toxicity: May damage the unborn child. Developmental effects, including post implantation loss, foetal malformations and pup mortality, have been observed in rats, rabbits and mice following oral and/or dermal exposure [NICNAS]. - STOT (single exposure): May cause respiratory irritation. - STOT (repeated exposure): Not considered to cause serious damage to health from repeated oral and/or dermal exposure [NICNAS]. In a 90 day repeated dose inhalation toxicity study in rats, the NOAEC for both systemic toxicity and local irritation was defined as 0.5 mg/L. Effects observed at higher concentrations (≥ 1.0 mg/L) included nasal irritation and crust formation, retardation in male body weight gain, changes in red cell parameters, an increase in polymorphonuclear neutrophils and a decrease in lymphocytes; After recovery, male rats showed a significantly reduced body weight gain and cellular depletion in the testes [NICNAS]. - Aspiration toxicity: No information available.
Acute	
Ingestion	Acute toxicity (Oral): - LD50, Rat: 3,914 mg/kg [Supplier's SDS].
Other	Acute toxicity (Dermal): - LD50, Rat: 5,000 mg/kg [Supplier's SDS].
Carcinogen Category	None

12. ECOLOGICAL INFORMATION

Ecotoxicity	Aquatic toxicity: - LC50, Fish (Leuciscus idus): >500 mg/l (96 h) [Supplier's SDS]. - LC50, Crustacea (Daphnia magna): $>1,000$ mg/l (24 h) [Supplier's SDS]. - EC50, Algae/aquatic plants (Desmodesmus subspicatus): >500 mg/l (72 h) [DIN 38412; Supplier's SDS]. - EC50, Bacteria (Activated sludge): >600 mg/l (0.5 h) [ISO 8192; Supplier's SDS].
Persistence/Degradability	No information available.
Mobility	No information available.
Environmental Fate	Prevent entry into drains and waterways.
Bioaccumulation Potential	No information available.
Environmental Impact	No Data Available

13. DISPOSAL CONSIDERATIONS

General Information	Dispose of contents/container in accordance with local/regional/national regulations.
Special Precautions for Land Fill	Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

14. TRANSPORT INFORMATION**Land Transport (Australia)**

ADG Code

Proper Shipping Name	N-methyl-2-pyrrolidinone
Class	C1 Combustible Liquids - Flash Point >60°C - <=93°C, Closed Cup
Subsidiary Risk(s)	No Data Available
	No Data Available
UN Number	No Data Available
Hazchem	No Data Available
Pack Group	No Data Available
Special Provision	No Data Available
Comments	NON-DANGEROUS GOODS: Not regulated for LAND transport.

Land Transport (Malaysia)

ADR Code

Proper Shipping Name	N-methyl-2-pyrrolidinone
Class	No Data Available
Subsidiary Risk(s)	No Data Available
	No Data Available
UN Number	No Data Available
Hazchem	No Data Available
Pack Group	No Data Available
Special Provision	No Data Available
Comments	NON-DANGEROUS GOODS: Not regulated for LAND transport.

Land Transport (New Zealand)

NZS5433

Proper Shipping Name	N-methyl-2-pyrrolidinone
Class	No Data Available
Subsidiary Risk(s)	No Data Available
	No Data Available
UN Number	No Data Available
Hazchem	No Data Available
Pack Group	No Data Available
Special Provision	No Data Available
Comments	NON-DANGEROUS GOODS: Not regulated for LAND transport.

Land Transport (United States of America)

US DOT

Proper Shipping Name	N-methyl-2-pyrrolidinone
Class	No Data Available
Subsidiary Risk(s)	No Data Available
	No Data Available
UN Number	No Data Available
Hazchem	No Data Available
Pack Group	No Data Available
Special Provision	No Data Available
Comments	NON-DANGEROUS GOODS: Not regulated for LAND transport.

Sea Transport

IMDG Code

Proper Shipping Name	N-methyl-2-pyrrolidinone
Class	No Data Available
Subsidiary Risk(s)	No Data Available
UN Number	No Data Available
Hazchem	No Data Available
Pack Group	No Data Available
Special Provision	No Data Available
EMS	No Data Available
Marine Pollutant	No
Comments	NON-DANGEROUS GOODS: Not regulated for SEA transport.

Air Transport

IATA DGR

Proper Shipping Name	N-methyl-2-pyrrolidinone
Class	No Data Available
Subsidiary Risk(s)	No Data Available
UN Number	No Data Available
Hazchem	No Data Available
Pack Group	No Data Available
Special Provision	No Data Available
Comments	NON-DANGEROUS GOODS: Not regulated for AIR transport.

National Transport Commission (Australia)

Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)

Dangerous Goods Classification	NOT Dangerous Goods according to the criteria of the Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)
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15. REGULATORY INFORMATION

General Information	N-METHYL-2-PYRROLIDONE
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SAFETY DATA SHEET N-METHYL-2-PYRROLIDINONE (NMP) REVISION 5, DATE 29 APR 20

Poisons Schedule (Aust)

Schedule 6

Environmental Protection Authority (New Zealand)

Hazardous Substances and New Organisms Amendment Act 2015

Approval Code

HSR001384 (Reassessed)

National/Regional Inventories

Australia (AIC)

Listed

Canada (DSL)

Not Determined

Canada (NDSL)

Not Determined

China (IECSC)

Not Determined

Europe (EINECS)

212-828-1

Europe (REACH)

Registered

Japan (ENCS/METI)

Not Determined

Korea (KECI)

Not Determined

Malaysia (EHS Register)

Not Determined

New Zealand (NZIoC)

Listed

Philippines (PICCS)

Not Determined

Switzerland (Giftliste 1)

Not Determined

Switzerland (Inventory of Notified Substances)

Not Determined

Taiwan (NCSR)

Not Determined

USA (TSCA)

Not Determined

16. OTHER INFORMATION

Related Product Codes

MEPYRR0400, MEPYRR0500, MEPYRR0600, MEPYRR0700, MEPYRR0800, MEPYRR0900, MEPYRR0901, MEPYRR0902, MEPYRR1000, MEPYRR1001, MEPYRR1002, MEPYRR1003, MEPYRR1004, MEPYRR1005, MEPYRR1006, MEPYRR1007, MEPYRR1008, MEPYRR1009, MEPYRR1010, MEPYRR1011, MEPYRR1012, MEPYRR1013, MEPYRR1100, MEPYRR1101, MEPYRR1200, MEPYRR1300, MEPYRR1301, MEPYRR1400, MEPYRR1500, MEPYRR1600, MEPYRR1601, MEPYRR1605, MEPYRR1610, MEPYRR1615, MEPYRR1700, MEPYRR1701, MEPYRR1702, MEPYRR1703, MEPYRR1710, MEPYRR1711, MEPYRR1712, MEPYRR1715, MEPYRR1800, MEPYRR1810, MEPYRR1811, MEPYRR1812, MEPYRR2000, MEPYRR2001, MEPYRR2002, MEPYRR2003, MEPYRR2010, MEPYRR2015, MEPYRR2020, MEPYRR2030, MEPYRR2040, MEPYRR2500, MEPYRR2550, MEPYRR2555, MEPYRR3000, MEPYRR4000, MEPYRR5000, MEPYRR5001, MEPYRR5100, MEPYRR5101, MEPYRR5600, MEPYRR6000, MEPYRR6001, MEPYRR6002, MEPYRR6003, MEPYRR6004, MEPYRR6005, MEPYRR6006

Revision

5

Revision Date

29 Apr 2020

Reason for Issue

Updated SDS

< Less Than

> Greater Than

Key/Legend

AICS Australian Inventory of Chemical Substances
atm Atmosphere
CAS Chemical Abstracts Service (Registry Number)
cm² Square Centimetres
CO₂ Carbon Dioxide
COD Chemical Oxygen Demand
deg C (°C) Degrees Celcius
EPA (New Zealand) Environmental Protection Authority of New Zealand
deg F (°F) Degrees Farenheit
g Grams
g/cm³ Grams per Cubic Centimetre
g/l Grams per Litre
HSNO Hazardous Substance and New Organism
IDLH Immediately Dangerous to Life and Health
immiscible Liquids are insoluable in each other.
inHg Inch of Mercury
inH₂O Inch of Water
K Kelvin
kg Kilogram
kg/m³ Kilograms per Cubic Metre
lb Pound
LC₅₀ LC stands for lethal concentration. LC₅₀ is the concentration of a material in air which causes the death of 50% (one half) of a group of test animals. The material is inhaled over a set period of time, usually 1 or 4 hours.
LD₅₀ LD stands for Lethal Dose. LD₅₀ is the amount of a material, given all at once, which causes the death of 50% (one half) of a group of test animals.
ltr or L Litre
m³ Cubic Metre
mbar Millibar
mg Milligram
mg/24H Milligrams per 24 Hours
mg/kg Milligrams per Kilogram
mg/m³ Milligrams per Cubic Metre
Misc or Miscible Liquids form one homogeneous liquid phase regardless of the amount of either component present.
mm Millimetre
mmH₂O Millimetres of Water
mPa.s Millipascals per Second
N/A Not Applicable
NIOSH National Institute for Occupational Safety and Health
NOHSC National Occupational Heath and Safety Commission
OECD Organisation for Economic Co-operation and Development
Oz Ounce
PEL Permissible Exposure Limit
Pa Pascal
ppb Parts per Billion
ppm Parts per Million
ppm/2h Parts per Million per 2 Hours
ppm/6h Parts per Million per 6 Hours
psi Pounds per Square Inch
R Rankine
RCP Reciprocal Calculation Procedure
STEL Short Term Exposure Limit
TLV Threshold Limit Value
tne Tonne
TWA Time Weighted Average
ug/24H Micrograms per 24 Hours
UN United Nations
wt Weight