



# Safety Data Sheet

## 1. PRODUCT IDENTIFICATION

Name	<b><i>n</i>-Methyl Pyrrolidone</b>
Synonyms	1-methyl-2-pyrrolidone; <i>n</i> -methyl-gamma-butyrolactam; 1-methyl-2-pyrrolidinone; NMP & others
CAS#	872-50-4
Europe EC#	212-828-1
Product Uses	petroleum refining, desulphurization, coatings, and others

### EMERGENCY INFORMATION

Canada Call CANUTEC (collect) (613) 996-6666  
U.S.A. Call CHEMTREC (800) 424-9300

## 2. HAZARDS

<b>GHS Class</b> (Category)	<i>combustible</i> (4)	<i>skin irritant</i> (3)	<i>eye irritant</i> (2A)	<i>STOT</i> (3)
<b>Signal Words</b>	<b>WARNING</b>	<b>WARNING</b>	<b>WARNING</b>	<b>WARNING</b>
<b>Hazard Statements</b>	<i>no Pictogram</i> <i>combustible</i> <i>liquid (H227)</i>	<i>causes mild</i> <i>skin irritation</i> <i>(H316)</i>	<i>causes serious</i> <i>eye irritation</i> <i>(H319)</i>	<i>causes respiratory</i> <i>tract irritation</i> <i>(H335)</i>



### GHS Precautionary Statements for Labelling

P210	Keep away from heat, sparks, open flames and hot surfaces. No smoking.
P262	Do not get in eyes, on skin or on clothing.
P264	Wash thoroughly after handling.
P280	Wear eye protection, protective gloves and clothing of butyl or "Viton".

Canada – WHMIS  
Key:

**B 3, D 2B** (*NMP is very near the upper limit for B 3*)  
**B 2** – Flash Point <38°C, **B 3** – Flash Point >38°C & <93°C  
**D 1** – Immediately Toxic, **D 2** – Chronic Toxicity  
**C** – Oxidising Substance, **E** – Corrosive, **F** – Reactive Substance



## 3. COMPOSITION

	%	TWAEV / TLV ppm / mg/m <sup>3</sup>	LD <sub>50</sub> (mg/kg) ORAL	LD <sub>50</sub> (mg/kg) SKIN	LC <sub>50</sub> ppm INHALATION
1-Methyl-2-Pyrrolidone	100%	10 / 40 (skin)	3900	8000	not known

**Please ensure that this SDS is given to, and explained to people using this product.**

#### 4. FIRST AID

SKIN: Wash with plenty of water. Remove contaminated clothing and do not reuse until thoroughly laundered.  
EYES: Wash eyes with plenty of water, holding eyelids open. Seek medical assistance if there is any irritation.  
INHALATION: Remove from contaminated area promptly. **CAUTION: Rescuer must not endanger himself!** If breathing stops, administer artificial respiration and seek medical aid promptly.  
INGESTION: Give plenty of water to dilute product. Do not induce vomiting (NOTE below). Keep victim quiet. If vomiting occurs, lower victim's head below hips to prevent inhalation of vomited material. Seek medical help promptly.

*Inadvertent inhalation of vomited material may seriously damage the lungs. The danger of this is greater than the risk of poisoning through absorption of this relatively low-toxicity substance. The stomach should only be emptied under medical supervision, and after the installation of an airway to protect the lungs.*

#### 5. FIRE FIGHTING & FLAMMABILITY

Flash Point	>90°C / >194°F (closed cup); 91°C / 196°F (Pensky Martens closed cup) <sup>1</sup>
Autoignition Temperature	>245°C / >473°F; 270°C / 518°F <sup>1</sup> – various values reported
Flammable Limits	1.3% ó 9.5%
Combustion Products	carbon monoxide, nitrogen oxides, smoke, part oxidised hydrocarbon fragments
Firefighting Precautions	alcohol-resistant foam, dry chemical, water fog or spray, water jet may spread flames; firefighters must wear SCBA
Static Charge Accumulation	cannot accumulate a static charge on agitation or pumping

#### 6. ACCIDENTAL RELEASE MEASURES

Leak Precaution dyke to control spillage and prevent environmental contamination  
Handling Spill recover free liquid with suitable pumps; absorb residue on an inert sorbent, sweep, shovel & store in closed containers for recycling or disposal

#### 7. HANDLING & STORAGE

Store in a cool, dry environment, away from sources of ignition, strong acids or strong alkalis and oxidising agents.

Similar products (*but n-methyl pyrrolidone is not known to*) may react with oxygen in the air to form explosive or flammable peroxides. Ensure that containers are full & tightly sealed. If prolonged storage of a part container is anticipated, flush headspace with dry nitrogen gas prior to sealing. Empty containers may contain a flammable or explosive vapour. Always ensure that containers, whether empty or full, are tightly sealed unless in use.

Avoid breathing product vapour. Never cut, drill, weld or grind on or near this container. Avoid contact with skin and wash work clothes frequently. An eye bath and safety shower must be available near the workplace.

**Warning: Exercise extra caution when handling potentially toxic substances dissolved in *n*-methyl pyrrolidone (NMP). Although NMP itself has low toxicity, it may facilitate & accelerate the transport of other substances across the skin and into the body.**

#### 8. EXPOSURE CONTROL & PERSONAL PROTECTION

Ontario TWAEV	100ppm / 400mg/m <sup>3</sup>	Ontario STEV	not listed
ACGIH TLV	not listed	ACGIH STEL	not listed
OSHA PEL	not listed	OSHA STEL	not listed
Ventilation	mechanical ventilation may be required to control airborne titre		
Hands	butyl rubber gloves recommended ó other types may also protect; consult supplier to confirm suitability		
Eyes	safety glasses with side shields ó always protect the eyes		
Clothing	no special protective clothing required		

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**9. PHYSICAL PROPERTIES**

Odour & Appearance	clear, colourless, hygroscopic liquid with mild amine odour
Odour Threshold	not known
Vapour Pressure	0.29mmHg / 0.039kPa (20°C / 68°F)
Evaporation Rate ( <i>Butyl Acetate</i> = 1)	0.06
Vapour Density (air = 1)	3.4
Boiling Range	202°C / 396°F
Melting Point	-24°C / -12°F
Specific Gravity	1.03 (20/20°C)
Water Solubility	complete
Also soluble in	most organic solvents, limited solubility in aliphatic hydrocarbons
Log P <sub>O/W</sub> (Octanol/H <sub>2</sub> O partition)	-0.38
Viscosity	1.8centipoise (20°C / 68°F)
pH	7.7-8.0 (10% solution)
Conversion Factor	1ppm = 4.05mg/m <sup>3</sup>
Molecular Weight	99grams per mole

**10. REACTIVITY**

Dangerously Reactive With	strong oxidising agents
Also Reactive With	strong acids or alkalis cause vigorous hydrolysis to irritating 4-aminobutanoic acid
Stability	stable; will not polymerize
Decomposes in Presence of	highly acid or highly alkaline medium
Decomposition Products	4-aminobutanoic acid
Sensitive to Mechanical Impact	no

**11. TOXICITY****Effects, Acute Exposure**

Skin Contact	mildly irritating to skin
Skin Absorption	readily; nevertheless, no toxic effects expected by this route; <b><u>Warning:</u> May help to carry other substances across the skin and into the body.</b>
Eye Contact	liquid moderately irritating; vapour slightly irritating at 15ppm, severely so above 50ppm
Inhalation	above 16ppm caused discomfort; above 49ppm described as unbearable
Ingestion	not known, likely to be only slightly toxic <i>ó</i> not a route of industrial exposure
LD <sub>50</sub> (oral)	3900mg/kg (rat), 3500mg/kg (rabbit), 4400mg/kg (guinea pig), 5300mg/kg (mouse)
LD <sub>50</sub> (skin)	8000mg/kg (rabbit)
LC <sub>50</sub> (inhalation)	<5100ppm (rat) <i>ó</i> part vapour, part mist tested due to low vapour pressure

**Effects, Chronic Exposure**

General	prolonged exposure may cause irritation, swelling, peeling skin, wrinkling & stinging; symptoms probably caused by the vigorous absorption of water by NMP
Sensitising	not a sensitizer in humans or animals
Carcinogen/Tumorigen	not considered a tumorigen or a carcinogen in humans or animals
Reproductive Effect	no known effect in humans; reproductive issues in rats on <u>oral administration</u> <i>ó</i> see NOAEL below
Mutagen	no known effect on humans or animals
Synergistic With	not known
NOAEL (developmental)	160mg/kg/day (rat, oral) <sup>1</sup> <i>not a route of industrial exposure</i>
NOAEL (fertility)	350mg/kg/day (rat, oral) <sup>1</sup> <i>not a route of industrial exposure</i>
NOAEL (male fertility)	1000mg/kg/day (rat, oral) <sup>1</sup> <i>not a route of industrial exposure</i>

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**12. ECOLOGICAL INFORMATION**

Bioaccumulation	rapidly eliminated from living organisms (~24 hour); cannot bioaccumulate
Biodegradation	biodegrades readily & rapidly in the presence of oxygen: in soil ½-life 4-12 days; in water 73% in 28 days, 88% in 30 days, 90% in 5 days
Abiotic Degradation	reacts with atmospheric hydroxyl radicals; estimated ½-life in air is 5 hours
Mobility in soil, water	water soluble; moves readily in soil & water
<b>Aquatic Toxicity</b>	
LC <sub>50</sub> (Fish, 96hr)	832mg/litre (Lepomis macrochirus), 4000mg/litre Leuciscus idus), 1072mg/litre (Pimephales promelas), 1400 & 2673mg/litre (Poecilia reticulata), 3048mg/litre (Salmo gairdneri)
EC <sub>50</sub> (Crustacea, 48hr)	4897mg/litre (Daphnia magna), 4655mg/litre (Gammarus sp), 1107mg/litre (Paleomonetes vulgaris)
EC <sub>50</sub> (Algae)	600mg/litre (Scenedesmus subspicatus) <sup>1</sup>
EC <sub>50</sub> (Bacteria)	>600mg/litre ( <i>industrial activated sludge</i> ) <sup>1</sup>
TDK (Bacteria)	9000mg/litre (Pseudomonas putida)

**13. DISPOSAL**

Waste Disposal	<b>do not flush to sewer</b> , recycle if possible, incinerate in approved facility with flue gas monitoring & scrubbing
Containers	<b>Drums</b> should be reused. Recondition and pressure test by a licensed reconditioner prior to re-use. <b>Pails</b> must be vented and thoroughly dried prior to crushing and recycling. <b>IBCs</b> (intermediate bulk containers): polyethylene bottle must be pressure tested & recertified at 30 months. Replace at 60 months (5yrs). Steel containers must be inspected, pressure tested & recertified every 5 years. <i>Never cut, drill, weld or grind on or near this container, even if empty</i>

**14. TRANSPORT CLASSIFICATION**

<i>Canada TDG</i>	<b>PIN</b>	<b>UN - not regulated for transport</b>
<b>AND</b>	<b>Shipping Name</b>	<b>not regulated for transport</b>
<i>U.S.A. 49 CFR</i>	<b>Class &amp; Packing Group</b>	<b>not regulated for transport</b>
<b>Marine Pollutant</b>		not a marine pollutant
<b>ERAP Required</b>		<b>NO</b>

**15. REGULATIONS**

<b>Canada DSL</b>	<b>on inventory</b>
<b>U.S.A. TSCA</b>	<b>on inventory</b>
<b>Europe EINECS</b>	<b>on inventory</b>

**U.S.A. Regulations:**

**Allowable Tolerances:** Residues of *n*-methylpyrrolidone are exempted from the requirement of a tolerance when used in accordance with good agricultural practice as inert (or occasionally active) ingredients in pesticide formulations applied to growing crops only. Use: solvent, cosolvent.

**TSCA Requirements:** A testing consent order is in effect for *N*-methylpyrrolidone for health effects testing. FR citation: 11/23/93.

**FIFRA Requirements:** Residues of *n*-methylpyrrolidone are exempted from the requirement of a tolerance when used in accordance with good agricultural practice as inert (or occasionally active) ingredients in pesticide formulations applied to growing crops only. Use: solvent, cosolvent.

**16. OTHER INFORMATION**

Prepared for Megaloid Laboratories by Peter Bursztyn, (705) 734-1577

Data from RTECS, HSDB (Haz. Substance Data Base), Cheminfo (CCOHS), IUCLID Datasheets (ESIS – European Chem. Substance Info. System), & others.

Preparation Date: **July 2005** Revision Date: **July 2008, July 2011, July 2014**

(1) European Chemicals Agency (ECHA) dossier on 1-methyl-2-pyrrolidone:

[http://apps.echa.europa.eu/registered/data/dossiers/DISS-9c7ba9cf-e217-5142-e044-00144f67d249/DISS-9c7ba9cf-e217-5142-e044-00144f67d249\\_DISS-9c7ba9cf-e217-5142-e044-00144f67d249.html](http://apps.echa.europa.eu/registered/data/dossiers/DISS-9c7ba9cf-e217-5142-e044-00144f67d249/DISS-9c7ba9cf-e217-5142-e044-00144f67d249_DISS-9c7ba9cf-e217-5142-e044-00144f67d249.html)

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