1. Identification

Product Name
1-Methyl-2-pyrrolidinone

Cat No.:
O3688; O3688-4; O3688RS-19; XXO3688ET200LI; NC1562562; NC1449594

CAS-No
872-50-4

Synonyms
1-Methyl-2-pyrrolidone; N-Methylpyrrolidone; NMP

Recommended Use
Laboratory chemicals.

Uses advised against
Food, drug, pesticide or biocidal product use.

Details of the supplier of the safety data sheet

Company
Fisher Scientific
One Reagent Lane
Fair Lawn, NJ 07410
Tel: (201) 796-7100

Emergency Telephone Number
CHEMTREC®, Inside the USA: 800-424-9300
CHEMTREC®, Outside the USA: 001-703-527-3887

2. Hazard(s) identification

Classification
This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

<table>
<thead>
<tr>
<th>Hazard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flammable liquids</td>
</tr>
<tr>
<td>Skin Corrosion/Irritation</td>
</tr>
<tr>
<td>Serious Eye Damage/Eye Irritation</td>
</tr>
<tr>
<td>Reproductive Toxicity</td>
</tr>
<tr>
<td>Specific target organ toxicity (single exposure)</td>
</tr>
<tr>
<td>Target Organs - Respiratory system.</td>
</tr>
<tr>
<td>Specific target organ toxicity - (repeated exposure)</td>
</tr>
<tr>
<td>Target Organs - Kidney, Liver, spleen, Blood.</td>
</tr>
</tbody>
</table>

Label Elements

Signal Word
Danger

Hazard Statements
Combustible liquid
1-Methyl-2-pyrrolidinone

Revision Date 26-Mar-2020

Causes skin irritation
Causes serious eye irritation
May cause respiratory irritation
May damage the unborn child
May cause damage to organs through prolonged or repeated exposure

Precautionary Statements

Prevention
Obtain special instructions before use
Do not handle until all safety precautions have been read and understood
Use personal protective equipment as required
Wash face, hands and any exposed skin thoroughly after handling
Wear eye/face protection
Do not breathe dust/fume/gas/mist/vapors/spray
Use only outdoors or in a well-ventilated area
Keep away from heat/sparks/open flames/hot surfaces. - No smoking
Keep cool

Response
If exposed or concerned: Get medical attention/advice
Inhalation
If INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
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 reuse
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

Fire
In case of fire: Use CO2, dry chemical, or foam for extinction

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

Disposal
Dispose of contents/container to an approved waste disposal plant

Hazards not otherwise classified (HNOC)


3. Composition/Information on Ingredients

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No</th>
<th>Weight %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-Methyl-2-pyrrolidone</td>
<td>872-50-4</td>
<td>99</td>
</tr>
</tbody>
</table>

4. First-aid measures

General Advice
May damage the unborn child. Immediate medical attention is required. Show this safety data sheet to the doctor in attendance.

Eye Contact
Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes.
Immediate medical attention is required.

**Skin Contact**
Wash off immediately with plenty of water for at least 15 minutes. Immediate medical attention is required.

**Inhalation**
Remove to fresh air. If not breathing, give artificial respiration. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Immediate medical attention is required.

**Ingestion**
Do NOT induce vomiting. Call a physician or poison control center immediately.

**Most important symptoms and effects**
None reasonably foreseeable. Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting, Central nervous system disorders

**Notes to Physician**
Treat symptomatically

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### 5. Fire-fighting measures

**Suitable Extinguishing Media**
Water spray, carbon dioxide (CO₂), dry chemical, alcohol-resistant foam. Water mist may be used to cool closed containers.

**Unsuitable Extinguishing Media**
No information available

- **Flash Point**
  91 °C / 195.8 °F

- **Method**
  No information available

- **Autoignition Temperature**
  346 °C / 654.8 °F

- **Explosion Limits**
  - Upper: 9.5 vol %
  - Lower: 1.3 vol %
  - Sensitivity to Mechanical Impact: No information available
  - Sensitivity to Static Discharge: No information available

**Specific Hazards Arising from the Chemical**
Combustible material. Containers may explode when heated. Keep product and empty container away from heat and sources of ignition.

**Hazardous Combustion Products**
Carbon monoxide (CO), Carbon dioxide (CO₂), Nitrogen oxides (NOx), peroxides.

**Protective Equipment and Precautions for Firefighters**
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear. Thermal decomposition can lead to release of irritating gases and vapors.

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### 6. Accidental release measures

**Personal Precautions**
Not to be used by pregnant workers and workers who have recently given birth or who are breastfeeding. Ensure adequate ventilation. Use personal protective equipment as required. Keep people away from and upwind of spill/leak. Evacuate personnel to safe areas.

**Environmental Precautions**
Remove all sources of ignition. Take precautionary measures against static discharges. Should not be released into the environment.

**Methods for Containment and Clean Up**
Soak up with inert absorbent material. Keep in suitable, closed containers for disposal. Remove all sources of ignition.
### 7. Handling and storage

**Handling**
Do not get in eyes, on skin, or on clothing. Not to be used by pregnant workers and workers who have recently given birth or who are breastfeeding. Wear personal protective equipment/face protection. Use only under a chemical fume hood. Do not breathe mist/vapors/spray. Do not ingest. If swallowed then seek immediate medical assistance. Keep away from open flames, hot surfaces and sources of ignition.

**Storage**
Keep containers tightly closed in a dry, cool and well-ventilated place. Keep away from heat, sparks and flame. Protect from light.

### 8. Exposure controls / personal protection

**Exposure Guidelines**

**Engineering Measures**
Ensure adequate ventilation, especially in confined areas. Ensure that eyewash stations and safety showers are close to the workstation location.

**Personal Protective Equipment**

**Eye/face Protection**
Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

**Skin and body protection**
Wear appropriate protective gloves and clothing to prevent skin exposure.

**Respiratory Protection**
Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

**Hygiene Measures**
Handle in accordance with good industrial hygiene and safety practice.

### 9. Physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical State</td>
<td>Liquid</td>
</tr>
<tr>
<td>Appearance</td>
<td>Colorless</td>
</tr>
<tr>
<td>Odor</td>
<td>Mild amine</td>
</tr>
<tr>
<td>Odor Threshold</td>
<td>No information available</td>
</tr>
<tr>
<td>pH</td>
<td>7.7 - 8.0</td>
</tr>
<tr>
<td>Melting Point/Range</td>
<td>-24 °C / -11.2 °F</td>
</tr>
<tr>
<td>Boiling Point/Range</td>
<td>202 °C / 395.6 °F @ 760 mmHg</td>
</tr>
<tr>
<td>Flash Point</td>
<td>91 °C / 195.8 °F</td>
</tr>
<tr>
<td>Evaporation Rate</td>
<td>No information available</td>
</tr>
<tr>
<td>Flammability (solid,gas)</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Flammability or explosive limits</td>
<td></td>
</tr>
<tr>
<td>Upper</td>
<td>9.5 vol %</td>
</tr>
<tr>
<td>Lower</td>
<td>1.3 vol %</td>
</tr>
<tr>
<td>Vapor Pressure</td>
<td>0.7 mbar @ 25 °C</td>
</tr>
<tr>
<td>Vapor Density</td>
<td>3.4</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>1.030</td>
</tr>
<tr>
<td>Solubility</td>
<td>miscible</td>
</tr>
<tr>
<td>Partition coefficient; n-octanol/water</td>
<td>No data available</td>
</tr>
<tr>
<td>Autoignition Temperature</td>
<td>346 °C / 654.8 °F</td>
</tr>
<tr>
<td>Decomposition Temperature</td>
<td>No information available</td>
</tr>
<tr>
<td>Viscosity</td>
<td>1.67 mPa s at 20 °C</td>
</tr>
<tr>
<td>Molecular Formula</td>
<td>C5 H9 N O</td>
</tr>
<tr>
<td>Molecular Weight</td>
<td>99.13</td>
</tr>
</tbody>
</table>
10. Stability and reactivity

Reactive Hazard
None known, based on information available.

Stability
Hygroscopic. Air sensitive. Light sensitive.

Conditions to Avoid
Incompatible products. Heat, flames and sparks. Exposure to air. Exposure to moist air or water. Exposure to light. Keep away from open flames, hot surfaces and sources of ignition.

Incompatible Materials
Strong oxidizing agents, Strong acids, Strong bases.

Hazardous Decomposition Products
Carbon monoxide (CO), Carbon dioxide (CO₂), Nitrogen oxides (NOx), peroxides.

Hazardous Polymerization
Hazardous polymerization does not occur.

Hazardous Reactions
None under normal processing.

11. Toxicological information

Acute Toxicity

Product Information

Component Information

<table>
<thead>
<tr>
<th>Component</th>
<th>LD50 Oral (Rat)</th>
<th>LD50 Dermal (Rabbit)</th>
<th>LC50 Inhalation (Rat)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-Methyl-2-pyrrolidone</td>
<td>LD50 = 3914 mg/kg</td>
<td>LD50 = 8 g/kg</td>
<td>LC50 &gt; 5.1 mg/L 4 h</td>
</tr>
</tbody>
</table>

Toxicologically Synergistic Products
No information available

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Irritation
Irritating to eyes, respiratory system and skin.

Sensitization
No information available.

Carcinogenicity
The table below indicates whether each agency has listed any ingredient as a carcinogen.

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No</th>
<th>IARC</th>
<th>NTP</th>
<th>ACGIH</th>
<th>OSHA</th>
<th>Mexico</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-Methyl-2-pyrrolidone</td>
<td>872-50-4</td>
<td>Not listed</td>
<td>Not listed</td>
<td>Not listed</td>
<td>Not listed</td>
<td>Not listed</td>
</tr>
</tbody>
</table>

Mutagenic Effects
Mutagenic effects have occurred in microorganisms.

Reproductive Effects
Experiments have shown reproductive toxicity effects on laboratory animals.

Developmental Effects
Substances known to cause developmental toxicity in humans. May cause harm to the unborn child.

Teratogenicity
Teratogenic effects have occurred in experimental animals.

STOT - single exposure
Respiratory system

STOT - repeated exposure
Kidney Liver spleen Blood

Aspiration hazard
No information available

Symptoms / effects, both acute and delayed
Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting, Central nervous system disorders.

Endocrine Disruptor Information
No information available

Other Adverse Effects
Tumorigenic effects have been reported in experimental animals.

12. Ecological information

---

Page 5 / 7
Ecotoxicity

<table>
<thead>
<tr>
<th>Component</th>
<th>Freshwater Algae</th>
<th>Freshwater Fish</th>
<th>Microtox</th>
<th>Water Flea</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-Methyl-2-pyrrolidone</td>
<td>EC50: &gt; 500 mg/L, 72h (Desmodesmus subspicatus)</td>
<td>LC50: = 1400 mg/L, 96h static (Poecilia reticulata)</td>
<td>Not listed</td>
<td>EC50: = 4897 mg/L, 48h (Daphnia magna)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>LC50: = 4000 mg/L, 96h static (Leuciscus idus)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>LC50: = 1072 mg/L, 96h static (Pimephales promelas)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>LC50: = 832 mg/L, 96h static (Lepomis macrochirus)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Persistence and Degradability
Persistence is unlikely

Bioaccumulation/Accumulation
No information available.

Mobility
Will likely be mobile in the environment due to its water solubility.

<table>
<thead>
<tr>
<th>Component</th>
<th>log Pow</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-Methyl-2-pyrrolidone</td>
<td>-0.46</td>
</tr>
</tbody>
</table>

13. Disposal considerations

Waste Disposal Methods
Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification.

14. Transport information

DOT Not regulated
TDG Not regulated
IATA Not regulated
IMDG/IMO Not regulated

15. Regulatory information

United States of America Inventory

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No</th>
<th>TSCA</th>
<th>TSCA Inventory notification - Active/Inactive</th>
<th>TSCA - EPA Regulatory Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-Methyl-2-pyrrolidone</td>
<td>872-50-4</td>
<td>X</td>
<td>ACTIVE</td>
<td>R</td>
</tr>
</tbody>
</table>

Legend:
TSCA - Toxic Substances Control Act, (40 CFR Part 710)
X - Listed
'-' - Not Listed
R - Indicates a substance that is the subject of a Section 6 risk management rule under TSCA.

TSCA 12(b) - Notices of Export
Not applicable

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No</th>
<th>TSCA 12(b) - Notices of Export</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-Methyl-2-pyrrolidone</td>
<td>872-50-4</td>
<td>Section 5</td>
</tr>
</tbody>
</table>

International Inventories
Canada (DSL/NDSL), Europe (EINECS/ELINCS/NLP), Philippines (PICCS), Japan (ENCS), Australia (AICS), China (IECSC), Korea (ECL).

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No</th>
<th>DSL</th>
<th>NDSL</th>
<th>EINECS</th>
<th>PICCS</th>
<th>ENCS</th>
<th>AICS</th>
<th>IECSC</th>
<th>KECL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-Methyl-2-pyrrolidone</td>
<td>872-50-4</td>
<td>X</td>
<td>-</td>
<td>212-828-1</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>KE-25324</td>
<td></td>
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</tbody>
</table>

U.S. Federal Regulations
1-Methyl-2-pyrrolidinone

Revision Date 26-Mar-2020

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No</th>
<th>Weight %</th>
<th>SARA 313 - Threshold Values %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-Methyl-2-pyrrolidone</td>
<td>872-50-4</td>
<td>99</td>
<td>1.0</td>
</tr>
</tbody>
</table>

SARA 311/312 Hazard Categories

See section 2 for more information

CWA (Clean Water Act)
Not applicable

Clean Air Act
Not applicable

OSHA - Occupational Safety and Health Administration
Not applicable

CERCLA
Not applicable

California Proposition 65
This product contains the following Proposition 65 chemicals.

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No</th>
<th>California Prop. 65</th>
<th>Prop 65 NSRL</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-Methyl-2-pyrrolidone</td>
<td>872-50-4</td>
<td>Developmental</td>
<td>-</td>
<td>Developmental</td>
</tr>
</tbody>
</table>

U.S. State Right-to-Know Regulations

<table>
<thead>
<tr>
<th>Component</th>
<th>Massachusetts</th>
<th>New Jersey</th>
<th>Pennsylvania</th>
<th>Illinois</th>
<th>Rhode Island</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-Methyl-2-pyrrolidone</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

U.S. Department of Transportation

Reportable Quantity (RQ): N
DOT Marine Pollutant: N
DOT Severe Marine Pollutant: N

U.S. Department of Homeland Security
This product does not contain any DHS chemicals.

Other International Regulations

Mexico - Grade
Slight risk, Grade 1

16. Other information

Prepared By
Regulatory Affairs
Thermo Fisher Scientific
Email: EMSDS.RA@thermofisher.com

Creation Date
12-Nov-2009
Revision Date
26-Mar-2020
Print Date
26-Mar-2020
Revision Summary
This document has been updated to comply with the US OSHA HazCom 2012 Standard replacing the current legislation under 29 CFR 1910.1200 to align with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS).

Disclaimer
The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

End of SDS