ALFAAA12260

# 1-Methyl-2-pyrrolidinone

## SECTION 1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

| | |
|---|---|
| **产品说明:** | 1-甲基-2-吡咯烷酮 |
| **Product Description:** | **1-Methyl-2-pyrrolidinone** |
| **Cat No. :** | **A12260** |
| **Synonyms** | 1-Methyl-2-pyrrolidone; N-Methylpyrrolidone; NMP |
| **CAS No** | 872-50-4 |
| **Molecular Formula** | C5 H9 N O |
| **Supplier** | Avocado Research Chemicals Ltd.<br>(Part of Thermo Fisher Scientific)<br>Shore Road, Heysham<br>Lancashire, LA3 2XY,<br>United Kingdom<br>Office Tel: +44 (0) 1524 850506<br>Office Fax: +44 (0) 1524 850608 |
| **Emergency Telephone Number** | For information **US** call: 001-800-227-6701 / **Europe** call: +32 14 57 52 11<br>Emergency Number **US:**001-201-796-7100 / **Europe:** +32 14 57 52 99<br>**CHEMTREC** Tel. No. **US:**001-800-424-9300 / **Europe:**001-703-527-3887 |
| **E-mail address** | begel.sdsdesk@thermofisher.com |
| **Recommended Use** | Laboratory chemicals. |
| **Uses advised against** | No Information available |

## SECTION 2. HAZARD IDENTIFICATION

| **Physical State** | **Appearance** | **Odor** |
|---|---|---|
| Liquid | Colorless | Mild amine |

**Emergency Overview**

Combustible liquid. May be harmful if swallowed. Causes skin irritation. Causes serious eye irritation. May cause respiratory irritation. May damage fertility or the unborn child. Sensitivity to light. Air sensitive. Hygroscopic.

**Classification of the substance or mixture**

| | |
|---|---|
| Flammable liquids. | Category 4 |
| Acute Oral Toxicity | Category 5 |
| Skin Corrosion/Irritation | Category 2 |
| Serious Eye Damage/Eye Irritation | Category 2 |
| Reproductive Toxicity | Category 1B |
| Specific target organ toxicity - (single exposure) | Category 3 |

**Label Elements**

**Signal Word** **Danger**

**Hazard Statements**
H227 - Combustible liquid
H303 - May be harmful if swallowed
H315 - Causes skin irritation
H319 - Causes serious eye irritation
H335 - May cause respiratory irritation
H360 - May damage fertility or the unborn child

**Precautionary Statements**
**Prevention**
P201 - Obtain special instructions before use
P202 - Do not handle until all safety precautions have been read and understood
P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking
P260 - Do not breathe dust/fume/gas/mist/vapors/spray
P264 - Wash face, hands and any exposed skin thoroughly after handling
P270 - Do not eat, drink or smoke when using this product
P271 - Use only outdoors or in a well-ventilated area
P280 - Wear eye protection/ face protection
**Response**
P301 + P312 - IF SWALLOWED: Call a POISON CENTER or doctor if you feel unwell
P302 + P352 - IF ON SKIN: Wash with plenty of soap and water
P304 + P340 - IF INHALED: Remove person 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 advice/attention
P332 + P313 - If skin irritation occurs: Get medical advice/attention
P370 + P378 - In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish
P362 + P364 - Take off contaminated clothing and wash it before reuse
**Storage**
P403 + P233 - Store in a well-ventilated place. Keep container tightly closed
**Disposal**
P501 - Dispose of contents/ container to an approved waste disposal plant

**Physical and Chemical Hazards**
Combustible material. Hygroscopic.
**Health Hazards**
May be harmful if swallowed. Causes skin irritation. Causes serious eye irritation. May cause respiratory irritation. May damage fertility or the unborn child.
**Environmental hazards**
Contains no substances known to be hazardous to the environment or not degradable in waste water treatment plants. . Will likely be mobile in the environment due to its water solubility. The product is water soluble, and may spread in water systems.

**Other Hazards**

This product does not contain any known or suspected endocrine disruptors.

## SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

| Component | CAS No | Weight % |
|---|---|---|
| 1-Methyl-2-pyrrolidone | 872-50-4 | 99 |

## SECTION 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**
. Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting, Central nervous system disorders

**Self-Protection of the First Aider**
Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves and prevent spread of contamination.

**Notes to Physician**
Treat symptomatically. Symptoms may be delayed.

## SECTION 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.

**Extinguishing media which must not be used for safety reasons**
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.

**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.

## SECTION 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. Remove all sources of ignition. Take precautionary measures against static discharges.

**Environmental Precautions**
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.

Refer to protective measures listed in Sections 8 and 13.

## SECTION 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.

**Specific Use(s)**
Use in laboratories

## SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

**Control Parameters**

| Component | Hong Kong | Thailand | European Union | The United Kingdom |
|---|---|---|---|---|
| 1-Methyl-2-pyrrolidone | - | | TWA: 40 mg/m³ (8h)<br>TWA: 10 ppm (8h)<br>Skin<br><br>STEL: 20 ppm (15min)<br>STEL: 80 mg/m³ (15min)<br>STEL: 80 mg/m³ (8h)<br>STEL: 20 ppm (8h) | STEL: 20 ppm 15 min<br>STEL: 80 mg/m³ 15 min<br>TWA: 10 ppm 8 hr<br>TWA: 40 mg/m³ 8 hr<br>Skin |

**Monitoring methods**
BS EN 14042:2003 Title Identifier: Workplace atmospheres. Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents. MDHS70 General methods for sampling airborne gases and vapours

**Exposure Controls**

**Engineering Measures**
Ensure adequate ventilation, especially in confined areas. Ensure that eyewash stations and safety showers are close to the workstation location. Wherever possible, engineering control measures such as the isolation or enclosure of the process, the introduction of process or equipment changes to minimise release or contact, and the use of properly designed ventilation systems, should be adopted to control hazardous materials at source.

**Personal protective equipment**

**Eye Protection** Goggles (European standard - EN 166)

**Hand Protection** Protective gloves

| Glove material | Breakthrough time | Glove thickness | EU standard | Glove comments |
|---|---|---|---|---|
| Nitrile rubber | < 30 minutes | 0.38 mm | Level 2 | Permeation rate 43 µg/cm2/min |
| Neoprene | < 140 minutes | 0.66 mm | Level 4 | Permeation rate 19 µg/cm2/min |
| | | | EN 374 | As tested under EN374-3 Determination of Resistance to Permeation by Chemicals |
| Butyl rubber | > 480 minutes | 0.50 mm | | |

Inspect gloves before use.
Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. (Refer to manufacturer/supplier for information)
Ensure gloves are suitable for the task: Chemical compatability, Dexterity, Operational conditions, User susceptibility, e.g.

sensitisation effects, also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion.
Remove gloves with care avoiding skin contamination.

| | |
|---|---|
| **Skin and body protection** | Long sleeved clothing |
| **Respiratory Protection** | When workers are facing concentrations above the exposure limit they must use appropriate certified respirators.<br>To protect the wearer, respiratory protective equipment must be the correct fit and be used and maintained properly |
| **Large scale/emergency use** | Use a NIOSH/MSHA or European Standard EN 136 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced<br>**Recommended Filter type:** Organic gases and vapours filter Type A Brown conforming to EN14387 |
| **Small scale/Laboratory use** | Use a NIOSH/MSHA or European Standard EN 149:2001 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.<br>**Recommended half mask:-** Valve filtering: EN405; or; Half mask: EN140; plus filter, EN 141<br>When RPE is used a face piece Fit Test should be conducted |
| **Hygiene Measures** | Handle in accordance with good industrial hygiene and safety practice. |
| **Environmental exposure controls** | No information available. |

## SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

| | | |
|---|---|---|
| **Appearance** | Colorless | |
| **Physical State** | Liquid | |
| **Odor** | Mild amine | |
| **Odor Threshold** | No data available | |
| **pH** | 7.7-8.0 | 100 g/L aq.sol |
| **Melting Point/Range** | -24 °C / -11.2 °F | |
| **Softening Point** | No data available | |
| **Boiling Point/Range** | 202 °C / 395.6 °F | @ 760 mmHg |
| **Flash Point** | 91 °C / 195.8 °F | **Method -** No information available |
| **Evaporation Rate** | No data available | |
| **Flammability (solid,gas)** | Not applicable | Liquid |
| **Explosion Limits** | **Lower** 1.3 vol %<br>**Upper** 9.5 vol % | |
| **Vapor Pressure** | 0.7 mbar @ 25 °C | |
| **Vapor Density** | 3.4 | (Air = 1.0) |
| **Specific Gravity / Density** | 1.030 | |
| **Bulk Density** | Not applicable | Liquid |
| **Water Solubility** | Miscible | |
| **Solubility in other solvents** | No information available | |
| **Partition Coefficient (n-octanol/water)** | | |
| **Component** | **log Pow** | |
| 1-Methyl-2-pyrrolidone | -0.46 | |
| **Autoignition Temperature** | 346 °C / 654.8 °F | |
| **Decomposition Temperature** | No data available | |
| **Viscosity** | 1.67 mPa s at 20 °C | |
| **Explosive Properties** | | explosive air/vapour mixtures possible |
| **Oxidizing Properties** | No information available | |
| **Molecular Formula** | C5 H9 N O | |
| **Molecular Weight** | 99.13 | |

## SECTION 10. STABILITY AND REACTIVITY

**Stability** Hygroscopic. Air sensitive. Light sensitive.

**Hazardous Reactions** None under normal processing.
**Hazardous Polymerization** No information available.

**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.

**Materials to avoid** Strong oxidizing agents. Strong acids. Strong bases.

**Hazardous Decomposition Products** Carbon monoxide (CO). Carbon dioxide ($CO_2$). Nitrogen oxides (NOx). peroxides.

## SECTION 11. TOXICOLOGICAL INFORMATION

**Product Information**

**(a) acute toxicity;**

| Component | LD50 Oral | LD50 Dermal | LC50 Inhalation |
|---|---|---|---|
| 1-Methyl-2-pyrrolidone | LD50 = 3914 mg/kg ( Rat ) | LD50 = 8 g/kg ( Rabbit ) | LC50 > 5.1 mg/L ( Rat ) 4 h |

**(b) skin corrosion/irritation;** Category 2

**(c) serious eye damage/irritation;** Category 2

**(d) respiratory or skin sensitization;**
**Respiratory** Based on available data, the classification criteria are not met
**Skin** Based on available data, the classification criteria are not met

**(e) germ cell mutagenicity;**

Mutagenic effects have occured in microorganisms

**(f) carcinogenicity;** Based on available data, the classification criteria are not met

There are no known carcinogenic chemicals in this product

**(g) reproductive toxicity;** Category 1B
**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.

**(h) STOT-single exposure;** Category 3

**Results / Target organs** Respiratory system

**(i) STOT-repeated exposure;** Based on available data, the classification criteria are not met

**Target Organs** None known.

**(j) aspiration hazard;** Based on available data, the classification criteria are not met

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

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

## SECTION 12. ECOLOGICAL INFORMATION

**Ecotoxicity effects** .

| Component | Freshwater Fish | Water Flea | Freshwater Algae | Microtox |
|---|---|---|---|---|
| 1-Methyl-2-pyrrolidone | LC50: = 1400 mg/L, 96h static (Poecilia reticulata)<br>LC50: = 1072 mg/L, 96h static (Pimephales promelas)<br>LC50: = 832 mg/L, 96h static (Lepomis macrochirus) | EC50: = 4897 mg/L, 48h (Daphnia magna) | EC50: > 500 mg/L, 72h (Desmodesmus subspicatus) | |

**Persistence and Degradability**

**Persistence** Persistence is unlikely.

| Component | Degradability |
|---|---|
| 1-Methyl-2-pyrrolidone<br>872-50-4 ( 99 ) | water: 73% 28 days OECD 301C<br>soil: >=90% 21 days |

**Bioaccumulative Potential** Bioaccumulation is unlikely

| Component | log Pow | Bioconcentration factor (BCF) |
|---|---|---|
| 1-Methyl-2-pyrrolidone | -0.46 | No data available |

**Mobility in soil** The product is water soluble, and may spread in water systems Will likely be mobile in the environment due to its water solubility Highly mobile in soils

**Endocrine Disruptor Information** This product does not contain any known or suspected endocrine disruptors
**Persistent Organic Pollutant** This product does not contain any known or suspected substance
**Ozone Depletion Potential** This product does not contain any known or suspected substance

## SECTION 13. DISPOSAL CONSIDERATIONS

**Waste from Residues/Unused Products** Waste is classified as hazardous. Dispose of in accordance with the European Directives on waste and hazardous waste. Dispose of in accordance with local regulations.

**Contaminated Packaging** Dispose of this container to hazardous or special waste collection point.

**Other Information** Waste codes should be assigned by the user based on the application for which the product was used. Do not empty into drains.

## SECTION 14. TRANSPORT INFORMATION

**Road and Rail Transport** Not Regulated

**IMDG/IMO** Not regulated

**IATA** Not regulated

**Special Precautions for User** No special precautions required

## SECTION 15. REGULATORY INFORMATION

**International Inventories**
X = listed, China (IECSC), Europe (EINECS/ELINCS/NLP), U.S.A. (TSCA), Canada (DSL/NDSL), Philippines (PICCS), Japan (ENCS), Japan (ISHL), Australia (AICS), Korea (KECL).

| Component | The Inventory of Hazardous Chemicals (2015 Edition) | List of dangerous goods GB 12268 - 2012 | IECSC | EINECS | TSCA | DSL | PICCS | ENCS | ISHL | AICS | KECL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1-Methyl-2-pyrrolidone | - | - | X | 212-828-1 | X | X | X | X | X | X | KE-25324 |

**National Regulations**

## SECTION 16. OTHER INFORMATION

**Prepared By** Health, Safety and Environmental Department
**Creation Date** 12-Nov-2009
**Revision Date** 23-Jul-2026
**Revision Summary** Not applicable.

**Training Advice**
Chemical hazard awareness training, incorporating labelling, Safety Data Sheets (SDS), Personal Protective Equipment (PPE) and hygiene.
Use of personal protective equipment, covering appropriate selection, compatibility, breakthrough thresholds, care, maintenance, fit and standards.
First aid for chemical exposure, including the use of eye wash and safety showers.
Chemical incident response training.
Fire prevention and fighting, identifying hazards and risks, static electricity, explosive atmospheres posed by vapours and dusts.

**Legend**

**CAS** - Chemical Abstracts Service

**EINECS/ELINCS** - European Inventory of Existing Commercial Chemical Substances/EU List of Notified Chemical Substances
**PICCS** - Philippines Inventory of Chemicals and Chemical Substances
**IECSC** - Chinese Inventory of Existing Chemical Substances
**KECL** - Korean Existing and Evaluated Chemical Substances

**TSCA** - United States Toxic Substances Control Act Section 8(b) Inventory
**DSL/NDSL** - Canadian Domestic Substances List/Non-Domestic Substances List
**ENCS** - Japanese Existing and New Chemical Substances
**AICS** - Australian Inventory of Chemical Substances
**NZIoC** - New Zealand Inventory of Chemicals

**WEL** - Workplace Exposure Limit
**ACGIH** - American Conference of Governmental Industrial Hygienists
**DNEL** - Derived No Effect Level
**RPE** - Respiratory Protective Equipment
**LC50** - Lethal Concentration 50%
**NOEC** - No Observed Effect Concentration
**PBT** - Persistent, Bioaccumulative, Toxic

**TWA** - Time Weighted Average
**IARC** - International Agency for Research on Cancer
**PNEC** - Predicted No Effect Concentration
**LD50** - Lethal Dose 50%
**EC50** - Effective Concentration 50%
**POW** - Partition coefficient Octanol:Water
**vPvB** - very Persistent, very Bioaccumulative

**ICAO/IATA** - International Civil Aviation Organization/International Air Transport Association
**ADR** - European Agreement Concerning the International Carriage of

**IMO/IMDG** - International Maritime Organization/International Maritime Dangerous Goods Code

Dangerous Goods by Road

**MARPOL** - International Convention for the Prevention of Pollution from Ships

**OECD** - Organisation for Economic Co-operation and Development

**ATE** - Acute Toxicity Estimate

**BCF** - Bioconcentration factor

**VOC** - (Volatile Organic Compound)

**Key literature references and sources for data**

https://echa.europa.eu/information-on-chemicals

Suppliers safety data sheet, Chemadvisor - LOLI, Merck index, RTECS

**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 Safety Data Sheet