

# SAFETY DATA SHEETS

According to the UN GHS revision 10

## 1: Identification

### 1.1 GHS Product identifier

**Product name** 1-Methyl-2-pyrrolidinone

### 1.2 Other means of identification

**Product number** 872-50-4

**Other names** 1-Methyl-2-pyrrolidinone

### 1.3 Recommended use of the chemical and restrictions on use

**Identified uses** Industrial and scientific research use.

**Uses advised against** no data available

### 1.4 Supplier's details

**Company** Zhongshan Greenrock Technology Co., Ltd.

**Address** No. 138, Jinsan Avenue, Sanjiao Town, Zhongshan City, Guangdong Province, China

**Telephone** +86-2087066781

### 1.5 Emergency phone number

**Emergency phone number** +86-2087066781

**Service hours** Monday to Friday, 9am-5pm (Standard time zone: UTC/GMT +8 hours).

## 2: Hazard identification

### 2.1 Emergency Overview

It is highly corrosive and can cause irreversible damage to the skin and eyes. If in contact, rinse immediately with plenty of water and seek medical help as soon as possible.

### 2.2 GHS Classification

Skin corrosion/irritation : Category 2

Serious eye damage/eye irritation : Category 2A

Specific target organ toxicity, single exposure; Respiratory tract irritation : Category 3

Reproductive toxicity : Category 1, 1A, 1B

### 2.3 GHS label elements, including precautionary statements

**Pictogram(s)****Signal word**

Danger

**Hazard statement(s)**

H315 Causes skin irritation

H319 Causes serious eye irritation

H335 May cause respiratory irritation

H360 May damage fertility or the unborn child

**Precautionary statement(s)****Prevention**

P203 Obtain, read and follow all safety instructions before use.

P261 Avoid breathing dust/fume/gas/mist/vapors/spray.

P264 Wash hands [and ...] thoroughly after handling.

P271 Use only outdoors or in a well-ventilated area.

P280 Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...

P264+P265 Wash hands [and ...] thoroughly after handling. Do not touch eyes.

**Response**

P318 if exposed or concerned, get medical advice.

P319 Get medical help if you feel unwell.

P321 Specific treatment (see ... on this label).

P302+P352 IF ON SKIN, wash with plenty of 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.

P332+P317 If skin irritation occurs, Get medical help.

P337+P317 If eye irritation persists, Get medical help.

P362+P364 Take off contaminated clothing and wash it before reuse.

**Storage**

P405 Store locked up.

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

**Disposal**

P501 Dispose of contents/container to ...

## 2.4 Physical and chemical

Acidic or alkaline substances that react with metals to produce flammable hydrogen. May cause violent exothermic reactions when in contact with other substances. At high concentrations, they have strong oxidizing or reducing properties.

## 2.5 Health hazards

Skin contact: May cause severe burns, tissue necrosis, and scarring. Eye contact: May cause corneal damage, vision loss, or even blindness. Inhalation of vapor or mist may cause respiratory burns and pulmonary edema.

## 2.6 Environmental hazards

Leakage into the environment can change the pH value of soil and water, causing serious ecological damage. It is highly toxic to aquatic organisms and can cause the death of aquatic organisms and the collapse of the ecosystem.

## 2.7 Other hazards which do not result in classification

no data available

## 3: Composition/information on ingredients

### 3.1 Substances

Chemical name	Common names and synonyms	CAS number	EC number	Concentration
1-Methyl-2-pyrrolidinone	1-Methyl-2-pyrrolidinone	872-50-4	212-828-1	99%

## 4: First-aid measures

### 4.1 General advice

Stop contact immediately and remove contaminated clothing; rinse the exposed area with plenty of running water and seek medical attention immediately with the material's SDS. If the corrosive substance is acidic (such as sulfuric acid), neutralize it with a weak alkaline solution (such as 5% sodium bicarbonate) after rinsing. For alkaline corrosive substances (such as sodium hydroxide), neutralize them with a weak acidic solution (such as 1% acetic acid).

### 4.2 If inhaled

Move to fresh air and keep the airway open. If corrosive vapors (such as hydrochloric acid mist) are inhaled, immediately administer nebulized inhalation (normal saline + dexamethasone). If laryngeal edema or breathing difficulties occur, immediately perform a tracheotomy (requires professional operation) and seek medical attention.

### 4.3 In case of skin contact

Rinse with plenty of running water for 20-30 minutes (make sure to rinse thoroughly, especially between the fingers, in the armpits, and other folds). If blisters are present, do not prick them; instead, apply a sterile gauze compress (to avoid adhesion). Do not apply oily ointments to avoid affecting subsequent treatment.

### 4.4 In case of eye contact

Immediately flush with an eyewash or plenty of normal saline for 15-20 minutes (use a gentle flow to avoid direct exposure to the cornea); apply antibiotic eye ointment (such as erythromycin ointment) to the eyelids, wear a sterile eye patch, and seek immediate medical attention from an ophthalmologist.

### 4.5 If swallowed

Do not induce vomiting (to avoid secondary damage to the esophageal mucosa). If the substance is acidic, take milk or egg white orally (to protect the gastric mucosa). If the substance is alkaline, take diluted vinegar (1:10 ratio) orally. If you carry SDS, seek medical attention immediately for a gastroscopy.

### 4.6 Most important symptoms and effects, both acute and delayed

Acute symptoms: skin redness, swelling, blisters, ulcers, severe eye pain, photophobia, blurred vision, oral/esophageal burns, and difficulty swallowing; long-term effects: skin scarring, corneal scarring (possibly causing blindness), and esophageal stenosis.

### 4.7 Protection of first-aiders

Rescuers must wear corrosion-resistant chemical protective clothing, chemical protective gloves (made of fluororubber), chemical goggles and masks; stand upwind when flushing to avoid inhaling volatile corrosive gases; after contact, equipment must be cleaned with a neutralizer and then rinsed with clean water.

## 4.8 Notes to physician

Inform the doctor of the type of corrosive agent (acid/base), concentration, and duration of contact. Skin burns should be treated according to their depth (superficial II degree and above require skin grafting). Eye injuries should be checked for corneal epithelial integrity and, if necessary, corneal repair drugs (such as recombinant human epidermal growth factor) should be used.

## 5: Fire-fighting measures

### 5.1 Unsuitable extinguishing media

Acidic corrosive substances (such as sulfuric acid): It is strictly forbidden to use water (it releases heat when in contact with water, causing splashing) or alkaline fire extinguishing agents (it neutralizes the heat and increases the risk); Alkaline corrosive substances (such as sodium hydroxide): It is strictly forbidden to use acidic fire extinguishing agents.

### 5.2 Specific hazards during fire fighting

Combustion is accompanied by splashing of corrosive liquids, causing severe burns to the skin/eyes; some corrosive substances (such as nitric acid) release toxic gases when burned and also corrode fire-fighting equipment; high-temperature molten substances (such as molten alkali) easily adhere to the skin and cause deep burns.

### 5.3 Hazardous combustion products

Acidic corrosive substances release hydrogen chloride and sulfur dioxide (such as sulfuric acid); alkaline corrosive substances release ammonia (such as ammonia water); chlorine-containing corrosive substances release chlorine gas.

### 5.4 Specific extinguishing methods

Small area: Use dry powder fire extinguishing agent to put out the fire. If it is solid corrosive material, cover it with dry sand (to isolate it from the air); Large area: Cool the surrounding containers first, then use dry powder to put out the fire. It is strictly forbidden to use water directly to prevent splashing; After extinguishing the fire, use a neutralizer (weak base for acid, weak acid for alkali) to deal with the leaked material.

### 5.5 Special protective equipment for fire-fighters

Wear fully enclosed corrosion-resistant chemical protective clothing, chemical protective gloves (fluororubber), chemical goggles + mask; carry a pH tester (to monitor the pH value of the leak); after the operation, the equipment needs to be cleaned with a neutralizer and then rinsed with clean water.

## 6: Accidental release measures

## **6.1 Protective measures for workers**

Wear fully enclosed chemical protective clothing (acid and alkali resistant), chemical protective gloves (fluororubber), chemical goggles + face mask; wear a gas mask (acid/alkali filter box) when dealing with volatile corrosive substances.

## **6.2 Environmental protection measure**

Prevent leaked material from contacting skin or eyes; do not discharge into water or soil; treat contaminated ground with a neutralizer (sodium carbonate for acid, dilute acetic acid for alkali) until neutral.

## **6.3 Containment methods for leaked chemicals**

Collect liquids in sealed polyethylene containers; collect solids with corrosion-resistant tools and place them in chemical-resistant bags (marked "corrosive"); store them in isolation after collection.

## **6.4 Cleanup methods for chemical spills**

Small leakage: absorb with acid/alkali resistant cotton and then neutralize; Large leakage: transfer to storage tank with corrosion resistant pump; After cleaning, flush the ground with plenty of water (if compatible), and collect the flushing water for neutralization.

## **6.5 Measures to prevent the spread of leaks**

Designate an 8-meter isolation zone; use corrosion-resistant isolation belts for blocking; and enhance ventilation (corrosion-resistant fans) for volatile corrosive substances.

## **6.6 Container leakage treatment**

Minor leaks: seal with acid/alkali resistant putty; severe leaks: evacuate, have professionals transfer remaining substances, and do not reuse damaged containers.

## **6.7 Special considerations**

In case of skin contact, rinse with an eyewash for 15 minutes; in case of eye contact, rinse with an eyewash for 15 minutes and seek medical attention; add reagents slowly during neutralization (to prevent heat release); clean protective equipment with neutralizer and then rinse with clean water.

# **7: Handling and storage**

## **7.1 Safe storage conditions**

Store in a corrosion-resistant warehouse (the floor is epoxy resin coated, and the walls are acid/alkali-resistant tiles); the container is made of corrosion-resistant material (glass fiber reinforced plastic for acid corrosion, high-density polyethylene for alkaline corrosion), with a capacity of ?200L to prevent dumping; the warehouse is equipped with an emergency neutralization tank (volume ?5m<sup>3</sup>) and equipped with acid/alkali neutralizers (such as sodium carbonate, dilute acetic acid).

## **7.2 Storage precautions**

Store them separately from materials that may come into contact with the skin (such as clothing and gloves) to avoid cross contamination. Use a corrosion-resistant forklift to transport containers and avoid impact. Check the humidity in the warehouse daily (?65%) to prevent moisture from exacerbating

corrosion. In case of leakage, immediately absorb it with inert materials (such as sand) and then treat it with a neutralizer.

### **7.3 VCI Storage Grade**

Level 2 (medium-high): Metal pipes and valves are coated with VCI anti-rust paint (acid/alkali resistant type) and maintained once every six months; VCI anti-rust blocks (such as urethane) are placed in the warehouse and replenished once every quarter to prevent corrosion of metal parts.

### **7.4 Recommended storage temperature**

5-35°, avoid sudden temperature changes (such as moving directly from a low temperature environment to a high temperature environment); concentrated acids/bases must be kept at a temperature >30° to prevent temperature increases from causing increased container pressure; in winter, they must be protected from freezing (temperature >5°) to prevent the solution from freezing and cracking the container (if the label has a recommended storage temperature, follow the label).

### **7.5 Handling**

For precautions see Safety Data Sheet section 2

Advice on safe handling : Work under hood. Do not inhale substance/mixture.

## **8: Exposure controls/personal protection**

### **8.1 Respiratory protection**

When exposed to corrosive vapors (such as hydrochloric acid mist and sulfuric acid mist), wear a powered air-purifying respirator (APF>50); in high-concentration environments, a positive pressure air respirator is required to avoid inhalation burns to the respiratory tract.

### **8.2 Recommended Filter type**

For acidic corrosive substances, choose Type E filter cartridge (protects against acidic gases such as SO<sub>2</sub> and HCl); for alkaline corrosive substances, choose Type K filter cartridge (protects against ammonia and amines); if the product contains dust, add Type P2 filter cotton.

### **8.3 Eye/face protection**

Wear chemical protective goggles + full-face mask. The mask must cover the chin. The lens should be made of polycarbonate (corrosion-resistant and impact-resistant). Check the sealing regularly.

### **8.4 Skin and body protection**

Wear corrosion-resistant chemical protective clothing made of fluororubber or polytetrafluoroethylene (PTFE) to avoid direct skin contact; wear an apron (of the same material) with protection covering the chest to the knees.

### **8.5 Hand protection**

Wear corrosion-resistant gloves. For acid corrosion, choose neoprene material; for alkaline corrosion, choose nitrile rubber material. The thickness of the gloves should be >0.5mm. Perform a water leakage test before use.

### **8.6 Hygiene measures**

Immediately after the operation, rinse the skin with running water for 10 minutes. If there is stinging at the contact site, apply a neutralizer (5% sodium bicarbonate for acid and 1% acetic acid for alkali) for 5 minutes. Do not use irritating skin care products to avoid aggravating skin damage.

## 9: Physical and chemical properties and safety characteristics

<b>Physical state</b>	colourless or light yellow liquid with an amine odour
<b>Colour</b>	Clear liquid
<b>Odour</b>	Mild amine odor
<b>Melting point/freezing point</b>	-24°C(lit.)
<b>Boiling point or initial boiling point and boiling range</b>	202°C(lit.)
<b>Flammability</b>	Combustible. Gives off irritating or toxic fumes (or gases) in a fire.
<b>Lower and upper explosion limit/flammability limit</b>	1.3-9.5%(V)
<b>Flash point</b>	91°C
<b>Auto-ignition temperature</b>	270°C
<b>Decomposition temperature</b>	Decomposes on heating and on burning. This produces toxic fumes including nitrogen oxides and carbon monoxide.
<b>pH</b>	pH = 7.7-8
<b>Kinematic viscosity</b>	1.65 cP at 25°C
<b>Solubility</b>	In water: >=10 g/100 mL at 20 oC
<b>Partition coefficient n-octanol/water</b>	log Kow = -0.38
<b>Vapour pressure</b>	0.29 mm Hg ( 20 °C)
<b>Density and/or relative density</b>	1.028g/mL at 25°C(lit.)
<b>Relative vapour density</b>	3.4 (vs air)
<b>Particle characteristics</b>	no data available

## 10: Stability and reactivity

### 10.1 Reactivity

no data available

### 10.2 Chemical stability

NMP shows unlimited shelf life in tightly closed containers, slight discoloration does not impair its quality.

### 10.3 Possibility of hazardous reactions

Combustible when exposed to heat, open flame, or powerful oxidizers. This amine is a very mild chemical base. It does tend to neutralize acids to form salts plus water. The amount of heat that is evolved per mole of amine in a neutralization is largely independent of the strength of the amine as a base. Amines may be incompatible with isocyanates, halogenated organics, peroxides, phenols (acidic), epoxides, anhydrides, and acid halides. Flammable gaseous hydrogen is generated by amines in combination with strong reducing agents, such as hydrides.

### 10.4 Conditions to avoid

no data available

### 10.5 Incompatible materials

Reacts with sulfur or carbon disulfide at high temperatures and pressures.

### 10.6 Hazardous decomposition products

Decomposes on heating and on burning. This produces toxic fumes including nitrogen oxides and carbon monoxide.

## 11: Toxicological information

### 11.1 Acute toxicity

Oral: LD50 Rat oral 3914 mg/kg

Inhalation: no data available

Dermal: no data available

### 11.2 Skin corrosion/irritation

no data available

### 11.3 Serious eye damage/irritation

no data available

### 11.4 Respiratory or skin sensitization

no data available

### 11.5 Germ cell mutagenicity

no data available

## **11.6 Carcinogenicity**

no data available

## **11.7 Reproductive toxicity**

no data available

## **11.8 STOT-single exposure**

no data available

## **11.9 STOT-repeated exposure**

no data available

## **11.10 Aspiration hazard**

no data available

# **12: Ecological information**

## **12.1 Toxicity**

Toxicity to fish: no data available

Toxicity to daphnia and other aquatic invertebrates: LC50; Species: Daphnia magna (Water Flea) age <24 hr; Conditions: freshwater, static, 23°C, pH 7, dissolved oxygen 7.8 mg/L; Concentration: 2500 ug/L for 24 hr (95% confidence interval: 1800-3500 ug/L) />99.9% purity

Toxicity to algae: no data available

Toxicity to microorganisms: no data available

## **12.2 Persistence and degradability**

AEROBIC: In a static die-away system using a sewage sludge seed and a semi-continuous activated sludge system, 1-methyl-2-pyrrolidinone displayed 95% removal after 2 weeks and an average 7 day biodegradability of 95%, respectively(1). 1-Methyl-2-pyrrolidinone at an initial concentration of 210 ppm underwent >98% removal after 24 hrs when inoculated with a sewage sludge seed(2). 1-Methyl-2-pyrrolidinone at an initial concentration of 150 mg/L underwent 94% removal as measured by COD after a 1 day lag period in a screening study using an activated sludge seed(3). In a model flow-through biological treatment apparatus with an 18-hour retention time, 1-methyl-2-pyrrolidinone at an initial concentration of 300 mg/L underwent >98% removal using an activated sewage sludge(4). In a static screening test, 1-methyl-2-pyrrolidinone underwent >90% removal after a 3-5 day acclimation period using a sewage sludge seed(5). 1-Methyl-2-pyrrolidinone, present at 100 mg/L, reached 73% of its theoretical BOD in 4 weeks using an activated sludge inoculum at 30 mg/L in the Japanese MITI test(6).

## **12.3 Bioaccumulative potential**

An estimated BCF of 3 was calculated in fish for 1-methyl-2-pyrrolidone(SRC), using a log Kow of -0.38(1). According to a classification scheme(3), this BCF suggests the potential for bioconcentration in aquatic organisms is low(SRC).

## **12.4 Mobility in soil**

The Koc of 1-methyl-2-pyrrolidone is estimated as 5(SRC), using a log Kow of -0.38(1) and a regression-derived equation(2). According to a classification scheme(3), this estimated Koc value suggests that 1-methyl-2-pyrrolidone is expected to have very high mobility in soil. 1-Methyl-2-pyrrolidinone had Rf values of 0.74, 0.65, 0.67, and 1.0 in silt, loam, clay and sand, respectively, in laboratory soil thin layer chromatography (TLC) experiments(4) which is consistent with significant mobility in soil(SRC).

## 12.5 Other adverse effects

no data available

## 13: Disposal considerations

### 13.1 Disposal methods for waste chemicals

Acidic corrosives can be treated with alkaline neutralizers (such as sodium carbonate) until neutralized and then disposed of as ordinary waste. Alkaline corrosives can be treated with acidic neutralizers (such as dilute hydrochloric acid) until neutralized and then disposed of. Those that cannot be neutralized must be incinerated at high temperature or chemically decomposed by a professional unit. The container must be thoroughly cleaned before being disposed of.

### 13.2 Precautions

Neutralization reactions must be conducted in well-ventilated, dedicated facilities, with the reaction rate controlled to prevent splashing. Disposal personnel must wear corrosion-resistant protective gear. The pH value of the neutralized waste must be controlled between 6 and 9. Direct disposal of unneutralized corrosive materials is prohibited. Emergency pools must be established at the disposal site to prevent leakage and contamination.

## 14: Transport information

### 14.1 UN Number

ADR/RID: UN1993

IMDG: UN1993

IATA: UN1993

### 14.2 UN Proper Shipping Name

ADR/RID: FLAMMABLE  
LIQUID, N.O.S.

IMDG: FLAMMABLE LIQUID,  
N.O.S.

IATA: FLAMMABLE LIQUID,  
N.O.S.

### 14.3 Transport hazard class(es)

ADR/RID: 4.3

IMDG: 4.3

IATA: 4.3

### 14.4 Packing group, if applicable

ADR/RID: I

IMDG: I

IATA: I

### 14.5 Environmental hazards

ADR/RID: no

IMDG: no

IATA: no

## 14.6 Special precautions for user

no data available

## 14.7 Transport in bulk according to IMO instruments

no data available

# 15: Regulatory information

## 15.1 Safety, health and environmental regulations specific for the product in question

Chemical name	Common names and synonyms	CAS number	EC number
1-Methyl-2-pyrrolidinone	1-Methyl-2-pyrrolidinone	872-50-4	212-828-1
New Zealand Inventory of Chemicals (NZIoC)			Listed.
Philippines Inventory of Chemicals and Chemical Substances (PICCS)			Listed.
Vietnam National Chemical Inventory			Listed.
Australian Inventory of Industrial Chemicals (AIIC)			Not Listed.
Catalogue of Strictly Restricted Toxic Chemicals in China			Not Listed.
China Catalog of Hazardous chemicals 2015			Not Listed.
European INventory of Existing Commercial chemical Substances			Not Listed.
IARC Monographs on the Evaluation of Carcinogenic Risks to Humans			Not Listed.
TSCA Inventory of Chemical Substances			Listed.

# 16: Other information

### Information on revision

SDS Creation Date July 1, 2025

SDS Revision Date July 1, 2025

### Abbreviations and acronyms in SDS

- CAS: Chemical Abstracts Service
- ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road
- RID: Regulation concerning the International Carriage of Dangerous Goods by Rail
- IMDG: International Maritime Dangerous Goods
- IATA: International Air Transportation Association
- TWA: Time Weighted Average
- STEL: Short term exposure limit
- LC50: Lethal Concentration 50%
- LD50: Lethal Dose 50%
- EC50: Effective Concentration 50%

## SDS References

- IPCS - The International Chemical Safety Cards (ICSC), website:  
<http://www.ilo.org/dyn/icsc/showcard.home>
- HSDB - Hazardous Substances Data Bank, website: <https://toxnet.nlm.nih.gov/newtoxnet/hsdb.htm>
- IARC - International Agency for Research on Cancer, website: <http://www.iarc.fr/>
- eChemPortal - The Global Portal to Information on Chemical Substances by OECD, website:  
[http://www.echemportal.org/echemportal/index?pageID=0&request\\_locale=en](http://www.echemportal.org/echemportal/index?pageID=0&request_locale=en)
- CAMEO Chemicals, website: <http://cameochemicals.noaa.gov/search/simple>
- ChemIDplus, website: <http://chem.sis.nlm.nih.gov/chemidplus/chemidlite.jsp>
- ERG - Emergency Response Guidebook by U.S. Department of Transportation, website:  
<http://www.phmsa.dot.gov/hazmat/library/erg>
- Germany GESTIS-database on hazard substance, website: <http://www.dguv.de/ifa/gestis/gestis-stoffdatenbank/index-2.jsp>
- ECHA - European Chemicals Agency, website: <https://echa.europa.eu/>

**Any questions regarding this Safety Data Sheet, Please send your inquiry to [sales@MolBest.com](mailto:sales@MolBest.com)**

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