Chemical Safety Data Sheet MSDS / SDS

1-methyl-2-pyrrolidone SDS

Revision Date:2024-04-25 Revision Number:1

SECTION 1: Identification of the substance/mixture and of the company/undertaking

Product identifier

Product name: 1-methyl-2-pyrrolidone

CAS: 872-50-4

Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses: For R&D use only. Not for medicinal, household or other use.

Uses advised against: none

Company Identification

Company: Chemicalbook.in

Address: 5 vasavi Layout Basaveswara Nilayam Pragathi Nagar Hyderabad, India -500090

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SECTION 2: Hazards identification

Classification of the substance or mixture

Skin irritation, Category 2
Eye irritation, Category 2

Specific target organ toxicity – single exposure, Category 3
Reproductive toxicity, Category 1B

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

Precautionary statement(s)

Prevention

P264 Wash ... thoroughly after handling.
P280 Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...
P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
P271 Use only outdoors or in a well-ventilated area.
P203 Obtain, read and follow all safety instructions before use.

Response

P302+P352 IF ON SKIN: Wash with plenty of water/...
P321 Specific treatment (see ... on this label).
P332+P317 If skin irritation occurs: Get medical help.
P362+P364 Take off contaminated clothing and wash it before reuse.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P319 Get medical help if you feel unwell.
P318 IF exposed or concerned, get medical advice.

Storage

P403+P233 Store in a well-ventilated place. Keep container tightly closed.
P405 Store locked up.

Disposal

P501 Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

Other hazards which do not result in classification

no data available

SECTION 3: Composition/information on ingredients

Substance

Chemical name:	1-methyl-2-pyrrolidone
Common names and synonyms:	1-methyl-2-pyrrolidone
CAS number:	872-50-4
EC number:	212-828-1
Concentration:	100%

SECTION 4: First aid measures

Description of necessary first-aid measures

If inhaled

Fresh air, rest. Refer for medical attention.

Following skin contact

Rinse skin with plenty of water or shower.

Following eye contact

First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then refer for medical attention.

Following ingestion

Rinse mouth. Refer for medical attention .

Most important symptoms/effects, acute and delayed

Inhalation of hot vapors can irritate nose and throat. Ingestion causes irritation of mouth and stomach. Contact with eyes causes irritation. Repeated and prolonged skin contact produces a mild, transient irritation. (USCG, 1999)

Indication of immediate medical attention and special treatment needed, if necessary

Immediate first aid: Ensure that adequate decontamination has been carried out. If patient is not breathing, start artificial respiration, preferably with a demand valve resuscitator, bag-valve-mask device, or pocket mask, as trained. Perform CPR if necessary. Immediately flush contaminated eyes with gently flowing water. Do not induce vomiting. If vomiting occurs, lean patient forward or place on the left side (head-down position, if possible) to maintain an open airway and prevent aspiration. Keep patient quiet and maintain normal body temperature. Obtain medical attention. Poisons A and B

SECTION 5: Firefighting measures

Suitable extinguishing media

Use water spray, powder, alcohol-resistant foam, carbon dioxide.

Specific hazards arising from the chemical

Special Hazards of Combustion Products: Toxic oxides of nitrogen may be formed in fire. (USCG, 1999)

Special protective actions for fire-fighters

Use water spray, powder, alcohol-resistant foam, carbon dioxide.

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures

Personal protection: filter respirator for organic gases and vapours adapted to the airborne concentration of the substance. Collect leaking liquid in sealable containers. Absorb liquid in sand or inert absorbent. Store and dispose of according to local regulations. Wash away remainder with plenty of water.

Environmental precautions

Personal protection: filter respirator for organic gases and vapours adapted to the airborne concentration of the substance. Collect leaking liquid in sealable containers. Absorb liquid in sand or inert absorbent. Store and dispose of according to local regulations.

Wash away remainder with plenty of water.

Methods and materials for containment and cleaning up

Spillage Disposal: Personal protection: filter respirator for organic gases and vapours adapted to the airborne concentration of the substance. Collect leaking and spilled liquid in sealable containers as far as possible. Absorb remaining liquid in sand or inert absorbent. Then store and dispose of according to local regulations.

SECTION 7: Handling and storage

Precautions for safe handling

NO open flames. Above 86°C use a closed system and ventilation. Handling in a well ventilated place. Wear suitable protective clothing. Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Use non-sparking tools. Prevent fire caused by electrostatic discharge steam.

Conditions for safe storage, including any incompatibilities

Dry. Ventilation along the floor. Separated from strong oxidants, strong acids, strong bases, copper and plastics.Small quantities can be stored in polyethylene, polypropylene, or clear glass bottles.

SECTION 8: Exposure controls/personal protection

Control parameters

Occupational Exposure limit values

EU-OEL: 40 mg/m3, 10 ppm as TWA; 80 mg/m3, 20 ppm as STEL; (skin).MAK: 82 mg/m3, 20 ppm; peak limitation category: II(2); skin absorption (H); pregnancy risk group: C

Biological limit values

no data available

Appropriate engineering controls

Ensure adequate ventilation. Handle in accordance with good industrial hygiene and safety practice. Set up emergency exits and the risk-elimination area.

Individual protection measures, such as personal protective equipment (PPE)

Eye/face protection

Wear safety goggles.

Skin protection

Protective gloves. Protective clothing.

Respiratory protection

Use local exhaust or ventilation.

Thermal hazards

no data available

SECTION 9: Physical and chemical properties and safety characteristics

Physical state:	Liquid.
Colour:	Clear, colorless.
Odour:	Mild amine odor
Melting point/freezing point:	-24.2 °C. Atm. press.:1 013 hPa. Remarks:Accuracy:?±?0.1?°C.
Boiling point or initial boiling point and boiling range:	204.3 °C. Atm. press.:1 015.8 hPa.
Flammability:	Combustible. Gives off irritating or toxic fumes (or gases) in a fire.
Lower and upper explosion limit/flammability limit:	no data available
Flash point:	91 °C. Atm. press.:1 013 hPa.
Auto-ignition temperature:	245 °C. Atm. press.:1 013 hPa.

Decomposition temperature:	no data available
pH:	pH = 7.7-8
Kinematic viscosity:	dynamic viscosity (in mPa s) = 1.661. Temperature:25.0°C.
Solubility:	greater than or equal to 100 mg/mL at 68° F (NTP, 1992)
Partition coefficient n-octanol/water:	log Pow = -0.46. Temperature:25 °C.
Vapour pressure:	0.32 hPa. Temperature:20 °C. Remarks:Extrapolated value from vapour pressure curve using the antoine equation.;0.46 hPa. Temperature:25 °C. Remarks:Extrapolated value from vapour pressure curve using the antoine equation.;2.54 hPa. Temperature:50 °C. Remarks:Extrapolated value from vapour pressure curve using the antoine equation.
Density and/or relative density:	1.03 g/cm3. Temperature:25 °C.
Relative vapour density:	3.4 (vs air)
Particle characteristics:	no data available

SECTION 10: Stability and reactivity

Reactivity

Decomposes on heating and on burning. This produces toxic fumes including nitrogen oxides. It reacts violently with strong acids and strong bases. Attacks copper and its alloys.

Chemical stability

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

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.

Conditions to avoid

no data available

Incompatible materials

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

Hazardous decomposition products

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

SECTION 11: Toxicological information

Acute toxicity

Oral: LD50 - rat (male/female) - 4 150 mg/kg bw.

Inhalation: LC50 - rat (male/female) - > 5.1 mg/L air.

Dermal: LD50 - rat (male/female) - > 5 000 mg/kg bw.

Skin corrosion/irritation

no data available

Serious eye damage/irritation

no data available

Respiratory or skin sensitization

no data available

Germ cell mutagenicity

no data available

Carcinogenicity

no data available

Reproductive toxicity

no data available

STOT-single exposure

The substance is irritating to the eyes and respiratory tract. The substance is mildly irritating to the skin. Exposure to very high concentrations could cause lowering of consciousness.

STOT-repeated exposure

Repeated or prolonged contact with skin may cause dermatitis. Animal tests show that this substance possibly causes toxic effects upon human reproduction.

Aspiration hazard

A harmful contamination of the air will not or will only very slowly be reached on evaporation of this substance at 20°C; on spraying or dispersing, however, much faster.

SECTION 12: Ecological information

Toxicity

Toxicity to fish: LC50 - Oncorhynchus mykiss (previous name: Salmo gairdneri) - > 500 mg/L - 96 h.

Toxicity to daphnia and other aquatic invertebrates: EC0 - Daphnia magna - > 1 000 mg/L - 24 h.

Toxicity to algae: EC50 - Desmodesmus subspicatus (previous name: Scenedesmus subspicatus) - 600.5 mg/L - 72 h.

Toxicity to microorganisms: EC50 - activated sludge, industrial - > 600 mg/L - 30 min. Remarks:Respiration rate.

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).

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).

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).

Other adverse effects

no data available

SECTION 13: Disposal considerations

Disposal methods

Product

The material can be disposed of by removal to a licensed chemical destruction plant or by controlled incineration with flue gas scrubbing. Do not contaminate water, foodstuffs, feed or seed by storage or disposal. Do not discharge to sewer systems.

Contaminated packaging

Containers can be triply rinsed (or equivalent) and offered for recycling or reconditioning. Alternatively, the packaging can be punctured to make it unusable for other purposes and then be disposed of in a sanitary landfill. Controlled incineration with flue gas scrubbing is possible for combustible packaging materials.

SECTION 14: Transport information

UN Number

ADR/RID: Not dangerous goods. (For reference only, please check.)
IMDG: Not dangerous goods. (For reference only, please check.)
IATA: Not dangerous goods. (For reference only, please check.)

UN Proper Shipping Name

ADR/RID: Not dangerous goods. (For reference only, please check.)
IMDG: Not dangerous goods. (For reference only, please check.)
IATA: Not dangerous goods. (For reference only, please check.)

Transport hazard class(es)

ADR/RID: Not dangerous goods. (For reference only, please check.)
IMDG: Not dangerous goods. (For reference only, please check.)
IATA: Not dangerous goods. (For reference only, please check.)

Packing group, if applicable

ADR/RID: Not dangerous goods. (For reference only, please check.)
IMDG: Not dangerous goods. (For reference only, please check.)
IATA: Not dangerous goods. (For reference only, please check.)

Environmental hazards

ADR/RID: No
IMDG: No
IATA: No

Special precautions for user

no data available

Transport in bulk according to IMO instruments

no data available

SECTION 15: Regulatory information

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

European Inventory of Existing Commercial Chemical Substances (EINECS)

Listed.

EC Inventory

Listed.

United States Toxic Substances Control Act (TSCA) Inventory

Listed.

China Catalog of Hazardous chemicals 2015

Not Listed.

New Zealand Inventory of Chemicals (NZIoC)

Listed.

(PICCS)

Listed.

Vietnam National Chemical Inventory

Listed.

IECSC)

Listed.

Korea Existing Chemicals List (KECL)

Listed.

SECTION 16: Other information

Abbreviations and acronyms

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%

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

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/

Other Information

N-Methyl-2-pyrrolidone enhances the skin permeability for other substances.