

SAFETY DATA SHEET (SDS)

in accordance with Regulation (EC) No 1907/2006 (REACH), Annex II — Regulation (EU) 2020/878

Date: 22.09.2026 | Version: 1 | EN

N-methyl-2-pyrrolidone

1-methylpyrrolidin-2-one

MOLAR MASS

99.13

LOGP

-0.5

CAS 872-50-4

C₅H₉NO

EC 212-828-1

HAZARD CLASSIFICATION (GHS / CLP)



Danger

H360D H335 H315 H319

Hazard class scope limited to the harmonised classification (CLP Annex VI); classes outside the harmonised entry may require supplier self-classification (CLP Art. 4(3)) — verify with the supplier safety data sheet.

1. Identification of the substance/mixture and of the company/undertaking

1.1 Substance name	N-methyl-2-pyrrolidone
1.1 IUPAC name	1-methylpyrrolidin-2-one
1.1 CAS number	872-50-4
1.1 EC number	212-828-1
1.1 PubChem CID	13387
1.1 InChIKey	SECXISVLQFMRJM-UHFFFAOYSA-N
1.1 SMILES	CN1CCCC1=O
1.1 Molecular formula	C ₅ H ₉ NO ^[7]
1.1 Molar mass	99.13 g/mol ^[7]
1.1 Exact mass	99.0684 Da ^[7]

1.2 Uses

For laboratory and research purposes. Not for use in the production of food, medicines or cosmetics without appropriate authorisation.

1.3 Details of the supplier

REFERENCE COPY — NO
SUPPLIER DETAILS — NOT FOR DISTRIBUTION

Supplier details are not included in this reference copy. The supplier placing the substance on the market must complete this section and remains responsible for the sheet under REACH. MolGod.org prepares documentation and is not the supplier of this substance.

1.4 Emergency telephone number

Emergency telephone +48 42 631 47 24

Toxicological Information Centre (CIT), Łódź — available 24/7

2. Hazards identification

GHS:



PPE:



Danger

Hazard statements (H) [3][4][12]

H360D	May damage the unborn child
H335	May cause respiratory irritation
H315	Causes skin irritation
H319	Causes serious eye irritation

Precautionary statements (P) [3][4][12]

P201	Obtain special instructions before use
P202	Do not handle until all safety precautions have been read and understood
P261	Avoid breathing dust/fume/gas/mist/vapours/spray
P264	Wash thoroughly after handling
P271	Use only outdoors or in a well-ventilated area
P280	Wear protective gloves/protective clothing/eye protection/face protection
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
P308+P313	IF exposed or concerned: Get medical advice/attention
P312	Call a POISON CENTER or doctor/physician if you feel unwell
P332+P313	If skin irritation occurs: Get medical advice/attention
P337+P313	If eye irritation persists: Get medical advice/attention
P403+P233	Store in a well-ventilated place: Keep container tightly closed
P405	Store locked up
P501	Dispose of contents/container to an approved waste collection point

Hazard class scope limited to the harmonised classification (CLP Annex VI); classes outside the harmonised entry may require supplier self-classification (CLP Art. 4(3)) — verify with the supplier safety data sheet.

3. Composition/information on ingredients

Substance type	pure substance
CAS Number	872-50-4
EC number	212-828-1
Molecular formula	C ₅ H ₉ NO
Concentration	≥99% (typical reagent-grade purity — to be confirmed by the supplier's specification)
Clp index no	606-021-00-7
Specyficzne stężenia graniczne / M-współczynnik (CLP Zał. VI Tab.3)	SCL: H335: C ≥ 10 % ^[3]

4. First aid measures



Inhalation

Move the affected person to fresh air. Keep at rest. If not breathing: artificial respiration (qualified personnel only). ^{[1][2][14]}

Skin contact

Remove contaminated clothing. Rinse skin with soap and water (min. 15 minutes). ^{[1][2][14]}

Eye contact

Rinse eyes with running water (min. 15 minutes). Remove contact lenses if possible. If irritation persists — consult an ophthalmologist. ^{[1][2][14]}

Ingestion

Do NOT induce vomiting (unless directed by a physician). Rinse mouth with water. Never give anything by mouth to an unconscious person. Poison Centre Łódź: +48 42 631 47 24 (24/7). Emergency number: 112. ^{[1][2][14]}

Symptoms and effects

cough, shortness of breath, headache, dizziness; skin redness and irritation; eye irritation and watering. ^{[3][12]}

Notes for physician

Requires verification

**Emergency numbers: Emergency: 112 (EU-wide).
Poison centre: as designated in the country of placing on the market (CLP Art. 45).**

5. Firefighting measures

Suitable extinguishing media	Adapt extinguishing media to surroundings. CO ₂ , dry powder, foam.
Unsuitable extinguishing media	No specific restrictions.
Specific hazards	Thermal decomposition products: CO, CO ₂ , NO _x . ^[15]
Advice for firefighters	Use self-contained breathing apparatus (SCBA). Full protective suit.
Flash Point	86°C ^[7]
Auto-ignition temperature	346°C ^[7]

6. Accidental release measures

Personal precautions	Use personal protective equipment (see Section 8). Avoid breathing vapours. ^{[1][2][14]}
Environmental precautions	Prevent entry into sewers, groundwater and surface water. ^{[1][2][14]}
Methods for containment and cleaning up	Contain the spill with a barrier. Absorb with inert material (sand, vermiculite, diatomaceous earth). Collect into sealed, labelled containers. Do not release into drains. ^{[1][2][14]}
Related sections	8; 13

7. Handling and storage

Precautions	Work in a fume hood or with adequate ventilation. No eating, drinking or smoking in the work area. ^{[1][2][14]}
Storage temperature	Store at room temperature (15-25°C) or as indicated on the label. ^{[1][2][14]}
Humidity	Store in a dry place (<60% RH). ^{[1][2][14]}
Light	Protect from direct sunlight. ^{[1][2][14]}
Incompatible materials	Strong oxidizers. ^[15]

8. Exposure controls/personal protection

8.1 Control parameters

OEL — NDS (Poland)	No NDS (OEL) value in the available working list — verify in the current MRPiPS regulation before use; do not assume the absence of a limit value.
OEL (EU)	The EU OEL value has not been verified against the available dataset — check the IOELV/BOELV directives; do not assume the absence of a value.
DNEL	No data available.
PNEC	No data available.

8.2 Personal protective equipment (PPE) ^{[5][6][16]}

 Chemical-resistant protective gloves EN ISO 374-1:2016+A1:2018 butyl (type B/C) – NOT latex	 Closed safety spectacles or goggles EN ISO 16321-1:2022 / EN 166:2001	 Respiratory protection EN 14387:2004+A1:2008 type A2 filter (organic vapours)	 Closed safety footwear with toe protection EN ISO 20345:2022 (S2/S3)
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9. Physical and chemical properties

Property (item 9.1)	Value	Source
Physical state	Liquid	
Colour	No data available.	
Odour	No data available.	
pH (1% aqueous solution)	No data available.	
Melting point	-23.09°C ^{[7][21]}	
Boiling point	202.0673°C ^{[8] [7]}	
Flash point	86°C ^{[7][21]}	
Flammability	No data available.	
Lower and upper explosion limit	1.52–9.5 % obj. ^[21]	
Density (20°C)	1.03 g/cm ³ ^{[7][21]}	
Vapour pressure	0.046 kPa (0.345 mmHg, 25°C) (experimental data) ^[7]	
Relative vapour density	3.42 ^[20]	

Property (item 9.1)	Value	Source
Dynamic viscosity	1.65 mPa·s ^[7]	
Kinematic viscosity	No data available.	
Refractive index n _D ²⁰	1.4684 (experimental data) ^[7]	
Auto-ignition temperature	346°C (experimental data) ^[7]	
Decomposition temperature	Not applicable	
Rozpuszcz. w wodzie	Miscible with water in all proportions. ^[9]	
Particle characteristics	Not applicable (REACH 9.1(r))	
Partition coefficient n-octanol/water (log value)	-0.5 ^{[9][22]}	
Molar mass	99.13 g/mol ^[7]	
Molecular formula	C ₅ H ₉ NO ^[7]	
Lipinski rule (RO5)	PASS	

Where a property above reads "No data available", no measured value was found in the public sources consulted for this substance. The property has not been determined by MolGod.org and no value is inferred. "Not applicable" means the property has no meaning for this substance in the form supplied.

10. Stability and reactivity

Reactivity	Stable under normal storage and handling conditions.
Chemical stability	Thermally stable under recommended conditions.
Hazardous reactions	No hazardous reactions known under normal conditions.
Conditions to avoid	High temperatures, direct sunlight, moisture.
Incompatible materials	Strong oxidizers.
Decomposition products	Thermal decomposition products: CO, CO ₂ , NO _x .

11. Toxicological information

LD50 (oral)	3914 mg/kg (rat) ^{[10][11][12]}
LD50 (dermal)	LD50 8000 mg/kg (rabbit) ^[7]
LC50 (inhalation)	No data available.
Skin irritation	Category 2 — skin irritation.
Eye irritation	Category 2 — eye irritation.
Sensitisation	Not classified for this hazard (outside the scope of the harmonised classification in CLP Annex VI; verify supplier self-classification) ^{[3][12]}
Mutagenicity	Not classified for this hazard (outside the scope of the harmonised classification in CLP Annex VI; verify supplier self-classification) ^{[3][12]}
Carcinogenicity	Not classified for this hazard (outside the scope of the harmonised classification in CLP Annex VI; verify supplier self-classification) ^{[3][12]}
IARC classification (carcinogenicity)	No individual IARC monograph for this CAS — this is not confirmation of the absence of carcinogenicity (cf. CLP/GHS classification in section 2).
Reproductive toxicity	Category 1A/1B (harmonised classification, Annex VI to CLP).
STOT — single exposure	Category 3 (H335): May cause respiratory irritation. ^{[3][12]}
STOT — repeated exposure	Not classified for this hazard (outside the scope of the harmonised classification in CLP Annex VI; verify supplier self-classification) ^{[3][12]}
Aspiration hazard	Not classified for this hazard (outside the scope of the harmonised classification in CLP Annex VI; verify supplier self-classification) ^{[3][12]}

12. Ecological information

Aquatic toxicity	LC ₅₀ (fish): 832 mg/L (Lepomis macrochirus, 96 h) ^[19]
Persistence / biodegradability	No data available.
Bioaccumulative potential	log Kow = -0.5 ^[9] . Low bioaccumulation potential (log Kow < 4.5 — PBT/vPvB screening criterion per ECHA Guidance R.11). ^{[17][18]}
Mobility in soil	No data available.
PBT/vPvB assessment	Insufficient data to assess PBT/vPvB.
Endocrine disrupting properties	No information.

13. Disposal considerations

Disposal method	Hand over for disposal to licensed contractors in accordance with national and local regulations. Do not discharge into sewers.
Waste code (EWC)	16 05 06* — Laboratory and analytical chemicals (np. chemical reagents) zawierające substancje niebezpieczne. EWC code verification required. ^[13]
Packaging	Cleaned packaging may be recycled. Contaminated packaging must be treated as hazardous waste.

14. Transport information

UN number	UN 1993 ^[7]
Environmental hazard	Not classified as environmentally hazardous for transport (no H400/H410/H411 in CLP Annex VI; no marine pollutant mark required) ^[3]
Special precautions	Handle as dangerous goods according to the assigned class (ADR/IMDG/IATA); apply the precautions appropriate to that class.
CN/HS code	CN/HS code: verification required in the Eurostat Combined Nomenclature.
Notes	UN number per the indicated source. Verify the transport class and packing group in ADR Table A / UN Model Regulations before shipment. ^[7]

15. Regulatory information

SVHC status	SVHC status not verified against the available dataset — check the current ECHA Candidate List; do not assume absence. ^[1]
REACH Annex XIV	Not verified against the ECHA Authorisation List — check REACH Annex XIV. ^[1]
REACH Annex XVII	Subject to general entries 28–30 of REACH Annex XVII (CMR substance cat. 1A/1B): sale to the general public prohibited — supply to professional users only. ^[1]

16. Other information

Legal status of classification: harmonised under CLP Annex VI — Reg. (EC) No 1272/2008 (as at the date of issue). Entries with an entry-into-force date after 22.09.2026 were omitted as future (not yet applicable).

Data aggregated automatically from public reference databases (PubChem, ECHA, NIST and others).

Scientific citations (10)

- Evgeny Bulatov, Dina Boyarskaya, Tatiana Chulkova et al.. 2,3-Diphenylmaleimide 1-methylpyrrolidin-2-one monosolvate. Acta Crystallographica Section E (2014). DOI: 10.1107/S1600536814002372
- Xi Li, Youwei Cheng, Ge Peng et al.. Naphthalene-2,6-dicarboxylic acid–1-methylpyrrolidin-2-one (1/2). Acta Crystallographica Section E (2011). DOI: 10.1107/S1600536810052396
- et al.. NMR spectroscopy and theoretical calculations in the conformational analysis of 1-methylpyrrolidin-2-one 3-halo-derivatives.. (2015). DOI: 10.1021/jp512378g
- Liu B, Jin X, Chen X et al.. Two New Lactam Derivatives from Micromelum falcatum (Lour.) Tan. with Brine Shrimp Larvae Toxicity.. Molecules (Basel, Switzerland) (2023). DOI: 10.3390/molecules28207157
- Carlos Ordonez, Marina S. Fonari, Qiang Wei et al.. Crystal structure of poly[bis(ammonium) [bis(μ4-benzene-1,3,5-tricarboxylato)dizincate] 1-methylpyrrolidin-2-one disolvate]. Acta Crystallographica Section E: Crystallographic Communications (2016). DOI: 10.1107/S2056989016007027

Full text of H statements

H360D	May damage the unborn child
H335	May cause respiratory irritation
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Full text of P statements

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Abbreviations

ADR	European Agreement concerning the International Carriage of Dangerous Goods by Road
ATE	Acute Toxicity Estimate
CAS	Chemical Abstracts Service
CLP	Classification, Labelling and Packaging (Reg. (EC) 1272/2008)
CMR	Carcinogenic, Mutagenic, toxic to Reproduction
DNEL	Derived No-Effect Level
EC	European Community number
EPI	Personal protective equipment
GHS	Globally Harmonized System
IATA	International Air Transport Association
IMDG	International Maritime Dangerous Goods Code
SDS	Safety Data Sheet
LC50	Lethal Concentration, 50%
LD50	Lethal Dose, 50%
NDS	Maximum admissible concentration (workplace, PL)
NDSch	Short-term exposure limit (PL)
OEL	Occupational Exposure Limit
PBT	Persistent, Bioaccumulative and Toxic
PNEC	Predicted No-Effect Concentration

REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals (Reg. (EC) 1907/2006)
STOT	Specific Target Organ Toxicity
SVHC	Substance of Very High Concern
TPSA	Topological Polar Surface Area
vPvB	very Persistent and very Bioaccumulative

Version history

v1 (22.09.2026) Based on ECHA harmonised classification (Annex VI to CLP, ATP 23).

References

- [1] EP and Council. Reg.(EC) No 1907/2006 (REACH). Art.31, Annex II. OJ EU L 396/2006. URL: <https://eur-lex.europa.eu/eli/reg/2006/1907/oj> Accessed: 2026-09-22.
- [2] European Commission. Reg.(EU) 2020/878 — amending Annex II REACH. OJ EU L 203/2020. From 01.01.2023. URL: <https://eur-lex.europa.eu/eli/reg/2020/878/oj> Accessed: 2026-09-22.
- [3] EP and Council. Reg.(EC) 1272/2008 (CLP) + ATP 23. OJ EU L 353/2008. (2026-07-07) URL: <https://eur-lex.europa.eu/eli/reg/2008/1272/oj> Accessed: 2026-09-22.
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- [5] ISO. ISO 7010:2019 — Graphical symbols. Safety signs. URL: <https://www.iso.org/standard/72424.html> Accessed: 2026-09-22.
- [6] ISO. ISO 3864-1:2011 — Safety colours and safety signs. URL: <https://www.iso.org/standard/51021.html> Accessed: 2026-09-22.
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- [9] Rumble, J.R., ed. CRC Handbook of Chemistry and Physics. 105th ed. Boca Raton: CRC Press, 2024. URL: <https://hbcpc.chemnetbase.com>
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- [12] ECHA. European Chemicals Agency — harmonised classification inventory (CLP Annex VI). URL: <https://echa.europa.eu>
- [13] European Commission. Decision 2000/532/EC establishing a list of wastes (European Waste Catalogue). OJ EU L 226/3. URL: <https://eur-lex.europa.eu/eli/dec/2000/532/oj>
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- [17] ECHA. Guidance on Information Requirements and Chemical Safety Assessment, Chapter R.11: PBT/vPvB Assessment. Helsinki: European Chemicals Agency. URL: <https://echa.europa.eu/guidance-documents/guidance-on-information-requirements-and-chemical-safety-assessment>
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External links

NIST: <https://webbook.nist.gov/cgi/cbook.cgi?ID=872-50-4>
 Wikidata: <https://www.wikidata.org/wiki/Q33103>
 ChEMBL: https://www.ebi.ac.uk/chembl/compound_report_card/ChEMBL12543

NFPA 704 (supplementary information — NFPA/USA system; not a required element of an EU safety data sheet under REACH Annex II)



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