



MATERIAL SAFETY DATA SHEET

according to the (US) Hazard Communication Standard (29 CFR 1910.1200)

Date of issue: 02/04/2013

Version 1.0

SECTION 1. Identification

Product identifier

Product number	808518
Product name	1-Vinyl-2-pyrrolidone (stabilized with N,N'-di-sec-butyl-1,4-phenylenediamine) for synthesis

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

Identified uses	Chemical for synthesis
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Details of the supplier of the safety data sheet

Company	EMD Millipore Corporation 290 Concord Road, Billerica, MA 01821, United States of America SDS Phone Support: +1-978-715-1335 General Inquiries: +1-978-715-4321 Monday to Friday, 9:00 AM to 4:00 PM Eastern Time (GMT-5) e-mail: mm_sds@merckgroup.com
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Emergency telephone	800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week
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SECTION 2. Hazards identification

GHS Classification

Acute toxicity, Category 3, Inhalation, H331
Acute toxicity, Category 3, Dermal, H311
Acute toxicity, Category 4, Oral, H302
Serious eye damage, Category 1, H318
Carcinogenicity, Category 2, H351
Specific target organ systemic toxicity - single exposure, Category 3, H335
Specific target organ systemic toxicity - repeated exposure, Category 2, H373
For the full text of the H-Statements mentioned in this Section, see Section 16.

GHS-Labeling

Hazard pictograms



Signal Word

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Danger

Hazard Statements

H302 Harmful if swallowed.

H311 + H331 Toxic in contact with skin or if inhaled.

H318 Causes serious eye damage.

H335 May cause respiratory irritation.

H351 Suspected of causing cancer.

H373 May cause damage to organs through prolonged or repeated exposure.

Precautionary Statements

P280 Wear protective gloves/ eye protection/ face protection.

P302 + P352 IF ON SKIN: Wash with plenty of soap and water.

P304 + P340 IF INHALED: Remove victim to fresh air and keep at rest in a position 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.

P309 + P310 IF exposed or if you feel unwell: Immediately call a POISON CENTER or doctor/physician.

OSHA Hazards

This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Other hazards

None known.

SECTION 3. Composition/information on ingredients

Formula	C ₆ H ₉ NO (Hill)
CAS-No.	88-12-0
Molar mass	111.14 g/mol

Hazardous ingredients

Chemical Name (Concentration)

CAS-No.

1-vinyl-2-pyrrolidone (≥ 90 % - ≤ 100 %)

88-12-0

SECTION 4. First aid measures

Description of first-aid measures

General advice

First aider needs to protect himself.

Inhalation

After inhalation: fresh air. Immediately apply artificial respiration. If necessary oxygen.

Immediately call in physician.

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Skin contact

After skin contact: wash off with plenty of water. Remove contaminated clothing. Call a physician immediately.

Eye contact

After eye contact: rinse out with plenty of water. Immediately call in ophthalmologist.

Ingestion

After swallowing: immediately make victim drink water (two glasses at most). Consult a physician.

Never give anything by mouth to an unconscious person.

Most important symptoms and effects, both acute and delayed

irritant effects, Cough, Shortness of breath

Indication of any immediate medical attention and special treatment needed

No information available.

SECTION 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media

Water, Carbon dioxide (CO₂), Foam, Dry powder

Unsuitable extinguishing media

For this substance/mixture no limitations of extinguishing agents are given.

Special hazards arising from the substance or mixture

Combustible material, Vapors are heavier than air and may spread along floors.

Forms explosive mixtures with air on intense heating.

Development of hazardous combustion gases or vapors possible in the event of fire.

Fire may cause evolution of:

nitrogen oxides, nitrous gases

Advice for firefighters

Special protective equipment for fire-fighters

Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

Further information

Suppress (knock down) gases/vapors/mists with a water spray jet. Prevent fire extinguishing water from contaminating surface water or the ground water system.

SECTION 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

Advice for non-emergency personnel: Do not breathe vapors, aerosols. Avoid substance contact. Ensure adequate ventilation. Evacuate the danger area, observe emergency procedures, consult an expert.

Advice for emergency responders: Protective equipment see section 8.

Environmental precautions

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Do not empty into drains.

Methods and materials for containment and cleaning up

Cover drains. Collect, bind, and pump off spills.

Observe possible material restrictions (see sections 7 and 10).

Take up with liquid-absorbent and neutralizing material (e.g. Chemisorb® OH⁻, Merck Art. No. 101596). Dispose of properly. Clean up affected area.

SECTION 7. Handling and storage

Precautions for safe handling

Observe label precautions.

Work under hood. Do not inhale substance/mixture. Avoid generation of vapors/aerosols.

Conditions for safe storage, including any incompatibilities

Tightly closed.

Keep locked up or in an area accessible only to qualified or authorized persons.

Store at +15°C to +25°C (+59°F to +77°F).

SECTION 8. Exposure controls/personal protection

Exposure limit(s)

Ingredients

Basis	Value	Threshold limits	Remarks
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1-vinyl-2-pyrrolidone 88-12-0

ACGIH	Time Weighted Average (TWA):	0.05 ppm	
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Engineering measures

Technical measures and appropriate working operations should be given priority over the use of personal protective equipment.

Individual protection measures

Protective clothing should be selected specifically for the workplace, depending on concentration and quantity of the hazardous substances handled. The chemical resistance of the protective equipment should be inquired at the respective supplier.

Hygiene measures

Change contaminated clothing. Wash hands and face after working with substance. Work under fume extractor. Under no circumstances eat or drink at workplace.

Eye/face protection

Tightly fitting safety goggles

Hand protection

Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

Other protective equipment:

protective clothing

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Respiratory protection

required when vapors/aerosols are generated.

Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

SECTION 9. Physical and chemical properties

Physical state	liquid
Color	colorless
Odor	characteristic
Odor Threshold	No information available.
pH	9 - 10 at 100 g/l 68 °F (20 °C)
Melting point	13 - 14 °C
Boiling point/boiling range	194 - 198 °F (90 - 92 °C) at 13 hPa
Flash point	203 °F (95 °C) Method: c.c.
Evaporation rate	No information available.
Flammability (solid, gas)	not applicable
Lower explosion limit	1.4 %(V)
Upper explosion limit	10 %(V)
Vapor pressure	0.12 hPa at 68 °F (20 °C)
Relative vapor density	3.8
Relative density	1.04 g/cm ³ at 68 °F (20 °C)
Water solubility	at 68 °F (20 °C) soluble

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Partition coefficient: n-octanol/water	log Pow: 0.4 (25 °C) OECD Test Guideline 107 Bioaccumulation is not expected (log Pow <1).
Autoignition temperature	No information available.
Decomposition temperature	No information available.
Viscosity, dynamic	2.4 mPa.s at 68 °F (20 °C)
Explosive properties	Not classified as explosive.
Ignition temperature	464 °F (240 °C) Method: DIN 51794

SECTION 10. Stability and reactivity

Reactivity

Forms explosive mixtures with air on intense heating.

Chemical stability

The product is chemically stable under standard ambient conditions (room temperature) .

Stabilizer

N,N-di-sec-butyl-1,4-phenylenediamine

Possibility of hazardous reactions

Violent reactions possible with:

Peroxides, polymerization initiators, Strong oxidizing agents, acids

Conditions to avoid

Strong heating.

A range from approx. 15 Kelvin below the flash point is to be rated as critical.

Incompatible materials

no information available

Hazardous decomposition products

in the event of fire: See section 5.

SECTION 11. Toxicological information

Information on toxicological effects

Likely route of exposure

Inhalation, Eye contact, Skin contact

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Acute oral toxicity

LD50 rat: 1,022 mg/kg (External MSDS)

absorption

Acute inhalation toxicity

LC50 rat: 3.07 mg/l; 4 h (Lit.) (Regulation (EC) No 1272/2008, Annex VI)

Symptoms: mucosal irritations, Cough, Shortness of breath, absorption

Irritating to respiratory system.

Acute dermal toxicity

LD50 rabbit: 560 mg/kg

(Regulation (EC) No 1272/2008, Annex VI) (RTECS)

absorption

Skin irritation

rabbit

Result: No irritation

(Lit.)

Eye irritation

rabbit

Result: Severe irritations

(Lit.)

Causes serious eye damage.

Sensitization

Sensitization test: guinea pig

Result: negative

Method: OECD Test Guideline 406

Genotoxicity in vivo

Mutagenicity (mammal cell test): micronucleus.

Result: negative

Method: OECD Test Guideline 474

Genotoxicity in vitro

Mutagenicity (mammal cell test):

Result: negative

Method: OECD Test Guideline 473

Ames test

Result: negative

(Lit.)

CMR effects

Carcinogenicity:

Suspected of causing cancer.

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Specific target organ systemic toxicity - single exposure

May cause respiratory irritation.

Specific target organ systemic toxicity - repeated exposure

May cause damage to organs through prolonged or repeated exposure.

Aspiration hazard

Regarding the available data the classification criteria are not fulfilled.

Carcinogenicity

IARC	No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.	
OSHA	No ingredient of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.	
NTP	No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.	
ACGIH	Confirmed animal carcinogen with unknown relevance to humans.	
	1-vinyl-2-pyrrolidone	88-12-0

Further information

Systemic effects:

Damage to:

Liver

Further data:

Handle in accordance with good industrial hygiene and safety practice.

SECTION 12. Ecological information

Ecotoxicity

Toxicity to fish

LC50 Oncorhynchus mykiss (rainbow trout): 913 mg/l; 96 h

OECD Test Guideline 203

Toxicity to daphnia and other aquatic invertebrates

EC50 Daphnia: 45 mg/l; 48 h

OECD Test Guideline 202

Toxicity to algae

IC50 Desmodesmus subspicatus (green algae): > 1,000 mg/l; 96 h

OECD Test Guideline 201

Toxicity to bacteria

EC20 activated sludge: 1,995 mg/l; 30 min

OECD Test Guideline 209

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Persistence and degradability

Biodegradability

100 %; 28 d

OECD Test Guideline 301A

Readily biodegradable.

Bioaccumulative potential

Partition coefficient: n-octanol/water

log Pow: 0.4 (25 °C)

OECD Test Guideline 107

Bioaccumulation is not expected (log Pow <1).

Mobility in soil

No information available.

Other adverse effects

Additional ecological information

Discharge into the environment must be avoided.

SECTION 13. Disposal considerations

The information presented only applies to the material as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations. Disposal should be in accordance with applicable regional, national and local laws and regulations.

SECTION 14. Transport information

Land transport (DOT)

UN number UN 2810

Proper shipping name TOXIC LIQUID, ORGANIC, N.O.S. (1-VINYL-2-PYRROLIDONE)

Class 6.1

Packing group III

Environmentally hazardous --

Air transport (IATA)

UN number UN 2810

Proper shipping name TOXIC LIQUID, ORGANIC, N.O.S. (1-VINYL-2-PYRROLIDONE)

Class 6.1

Packing group III

Environmentally hazardous --

Special precautions for user no

Sea transport (IMDG)

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UN number	UN 2810
Proper shipping name	TOXIC LIQUID, ORGANIC, N.O.S. (1-VINYL-2-PYRROLIDONE)
Class	6.1
Packing group	III
Environmentally hazardous	--
Special precautions for user	yes
EmS	F-A S-A

SECTION 15. Regulatory information

United States of America

OSHA Hazards

Toxic by inhalation.
Harmful if swallowed.
Toxic by skin absorption
Corrosive to eyes
Respiratory irritant
Carcinogen

This information is based on 29 CFR 1910.1200 criteria prior to adoption of the GHS, and may deviate from the GHS information on the label and in section 2.

SARA 311/312 Hazards

Acute Health Hazard
Chronic Health Hazard

SARA 313

SARA 313: This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 302

SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

Clean Water Act

This product does not contain any Hazardous Substances listed under the U.S. CleanWater Act, Section 311, Table 116.4A.

This product does not contain any Hazardous Chemicals listed under the U.S. CleanWater Act, Section 311, Table 117.3.

Massachusetts Right To Know

Remarks

No components are subject to the Massachusetts Right to Know Act.

Pennsylvania Right To Know

Ingredients

1-vinyl-2-pyrrolidone

New Jersey Right To Know

Ingredients

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1-vinyl-2-pyrrolidone

Notification status

TSCA: On TSCA Inventory

DSL: All components of this product are on the Canadian DSL.

SECTION 16. Other information

Training advice

Provide adequate information, instruction and training for operators.

Full text of H-Statements referred to under sections 2 and 3.

H302	Harmful if swallowed.
H311	Toxic in contact with skin.
H318	Causes serious eye damage.
H331	Toxic if inhaled.
H335	May cause respiratory irritation.
H351	Suspected of causing cancer.
H373	May cause damage to organs through prolonged or repeated exposure.

Key or legend to abbreviations and acronyms used in the safety data sheet

Used abbreviations and acronyms can be looked up at www.wikipedia.org.

Date of issue:02/04/2013

The information contained herein is based on the present state of our knowledge. It characterizes the product with regard to appropriate safety precautions. It does not represent a warranty of any product properties and we assume no liability for any loss or injury which may result from the use of this information. Users should conduct their own investigations to determine the suitability of the information.

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