SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1. Product identification

Product Description: N-Vinyl-2-pyrrolidone, stabilized
Cat No.: 354730000; 354730025; 354730050; 354735000
Synonyms: N-Vinylbutyrolactam
CAS-No: 88-12-0
EC-No.: 201-800-4
Molecular Formula: C6 H9 N O
Reach Registration Number: 01-2119498301-39

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

Recommended Use: Laboratory chemicals.
Uses advised against: No Information available

1.3. Details of the supplier of the safety data sheet

Company: UK entity/business name
Fisher Scientific UK
Bishop Meadow Road, Loughborough,
Leicestershire LE11 5RG, United Kingdom

EU entity/business name
Acros Organics BVBA
Janssen Pharmaceuticaal 3a
2440 Geel, Belgium

E-mail address: begel.sdsdesk@thermofisher.com

1.4. Emergency telephone number

For information US call: 001-800-ACROS-01 / Europe call: +32 14 57 52 11
Emergency Number US:001-201-796-7100 / Europe: +32 14 57 52 99
CHEMTREC Tel. No.US:001-800-424-9300 / Europe:001-703-527-3887

SECTION 2: HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

CLP Classification - Regulation (EC) No 1272/2008

Physical hazards
Based on available data, the classification criteria are not met

Health hazards
Acute oral toxicity Category 4 (H302)
Acute dermal toxicity Category 4 (H312)
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N-Vinyl-2-pyrrolidone, stabilized

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2.2. Label elements

Signal Word

Danger

Hazard Statements
H351 - Suspected of causing cancer
H373 - May cause damage to organs through prolonged or repeated exposure
H335 - May cause respiratory irritation
H318 - Causes serious eye damage
H302 - Harmful if swallowed
H332 - Harmful if inhaled
H312 - Harmful in contact with skin

Precautionary Statements
P280 - Wear protective gloves/ protective clothing/ eye protection/ face protection
P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P302 + P352 - IF ON SKIN: Wash with plenty of soap and water
P304 + P340 - IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing
P310 - Immediately call a POISON CENTER or doctor/ physician

2.3. Other hazards

No information available

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Substances

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No</th>
<th>EC-No.</th>
<th>Weight %</th>
<th>CLP Classification - Regulation (EC) No 1272/2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>N-Vinyl-2-pyrrolidone</td>
<td>88-12-0</td>
<td>EEC No. 201-800-4</td>
<td>&gt;95</td>
<td>Acute Tox. 4 (H302) Acute Tox. 4 (H312) Acute Tox. 4 (H332) Eye Dam. 1 (H318) Carc. 2 (H351)</td>
</tr>
</tbody>
</table>
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STOT SE 3 (H335)
STOT RE 2 (H373)

Reach Registration Number 01-2119498301-39

Full text of Hazard Statements: see section 16

SECTION 4: FIRST AID MEASURES

4.1. Description of first aid measures

General Advice If symptoms persist, call a physician.

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. Obtain medical attention.

Ingestion Clean mouth with water and drink afterwards plenty of water.

Inhalation Move to fresh air. If breathing is difficult, give oxygen. Obtain medical attention.

Self-Protection of the First Aider Use personal protective equipment.

4.2. Most important symptoms and effects, both acute and delayed

Causes eye burns.

4.3. Indication of any immediate medical attention and special treatment needed

Notes to Physician Treat symptomatically.

SECTION 5: FIREFIGHTING MEASURES

5.1. Extinguishing media

Suitable Extinguishing Media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Extinguishing media which must not be used for safety reasons
No information available.

5.2. Special hazards arising from the substance or mixture

Thermal decomposition can lead to release of irritating gases and vapors.

Hazardous Combustion Products
Carbon monoxide (CO), Carbon dioxide (CO2), Nitrogen oxides (NOx).

5.3. Advice for firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

SECTION 6: ACCIDENTAL RELEASE MEASURES
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6.1. Personal precautions, protective equipment and emergency procedures

Ensure adequate ventilation. Use personal protective equipment.

6.2. Environmental precautions

Should not be released into the environment. Do not flush into surface water or sanitary sewer system. See Section 12 for additional ecological information.

6.3. Methods and material for containment and cleaning up

Soak up with inert absorbent material. Keep in suitable, closed containers for disposal.

6.4. Reference to other sections

Refer to protective measures listed in Sections 8 and 13.

SECTION 7: HANDLING AND STORAGE

7.1. Precautions for safe handling

Wear personal protective equipment. Do not get in eyes, on skin, or on clothing. Avoid ingestion and inhalation. Ensure adequate ventilation.

Hygiene Measures
Handle in accordance with good industrial hygiene and safety practice.

7.2. Conditions for safe storage, including any incompatibilities

Keep containers tightly closed in a dry, cool and well-ventilated place. Store indoors. Do not freeze.

7.3. Specific end use(s)

Use in laboratories

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters

Exposure limits
List source(s):

<table>
<thead>
<tr>
<th>Component</th>
<th>The United Kingdom</th>
<th>European Union</th>
<th>Ireland</th>
</tr>
</thead>
<tbody>
<tr>
<td>N-Vinyl-2-pyrrolidone</td>
<td></td>
<td></td>
<td>TWA: 0.05 ppm 8 hr, STEL: 0.15 ppm 15 min</td>
</tr>
</tbody>
</table>

Biological limit values
This product, as supplied, does not contain any hazardous materials with biological limits established by the region specific regulatory bodies

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.

Derived No Effect Level (DNEL) Workers
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Predicted No Effect Concentration (PNEC)

Fresh water 0.045 mg/L
Fresh water sediment 0.22 mg/kg
Marine water 0.0045 mg/L
Marine water sediment 0.02 mg/kg
Water Intermittent 0.45 mg/L
Microorganisms in sewage treatment 3373 mg/L
Soil (Agriculture) 0.017 mg/kg

8.2. 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

<table>
<thead>
<tr>
<th>Glove material</th>
<th>Breakthrough time</th>
<th>Glove thickness</th>
<th>EU standard</th>
<th>Glove comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitrile rubber</td>
<td>See manufacturers</td>
<td>-</td>
<td>EN 374</td>
<td>(minimum requirement)</td>
</tr>
<tr>
<td>Neoprene</td>
<td>See manufacturers</td>
<td>-</td>
<td>EN 374</td>
<td></td>
</tr>
<tr>
<td>Natural rubber</td>
<td>See manufacturers</td>
<td>-</td>
<td>EN 374</td>
<td></td>
</tr>
<tr>
<td>PVC</td>
<td>See manufacturers</td>
<td>-</td>
<td>EN 374</td>
<td></td>
</tr>
</tbody>
</table>

Skin and body protection Long sleeved clothing

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 compatibility, 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.

Respiratory Protection
When workers are facing concentrations above the exposure limit they must use appropriate certified respirators.
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
**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.
**Recommended half mask:** Valve filtering: EN405; or; Half mask: EN140; plus filter, EN 141
When RPE is used a face piece Fit Test should be conducted

Environmental exposure controls Prevent product from entering drains.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Light yellow</td>
</tr>
<tr>
<td>Physical State</td>
<td>Liquid</td>
</tr>
<tr>
<td>Odor</td>
<td>Strong</td>
</tr>
<tr>
<td>Odor Threshold</td>
<td>No data available</td>
</tr>
<tr>
<td>pH</td>
<td>9-10</td>
</tr>
<tr>
<td>Melting Point/Range</td>
<td>13 - 14 °C / 55.4 - 57.2 °F</td>
</tr>
<tr>
<td>Softening Point</td>
<td>No data available</td>
</tr>
<tr>
<td>Boiling Point/Range</td>
<td>218 °C / 424 °F</td>
</tr>
<tr>
<td>Flash Point</td>
<td>95 °C / 203 °F</td>
</tr>
<tr>
<td>Evaporation Rate</td>
<td>No data available</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Explosion Limits</td>
<td>Lower 1.4 vol%</td>
</tr>
<tr>
<td></td>
<td>Upper 10 vol%</td>
</tr>
<tr>
<td>Vapor Pressure</td>
<td>0.12 mbar @ 20°C</td>
</tr>
<tr>
<td>Vapor Density</td>
<td>No data available</td>
</tr>
<tr>
<td>Specific Gravity / Density</td>
<td>1.043</td>
</tr>
<tr>
<td>Bulk Density</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Water Solubility</td>
<td>52.1 g/l @ 25°C</td>
</tr>
<tr>
<td>Solubility in other solvents</td>
<td>No information available</td>
</tr>
<tr>
<td>Partition Coefficient (n-octanol/water)</td>
<td>No information available</td>
</tr>
<tr>
<td>Component</td>
<td>log Pow</td>
</tr>
<tr>
<td>N-Vinyl-2-pyrrolidone</td>
<td>0.4</td>
</tr>
<tr>
<td>Autoignition Temperature</td>
<td>240 °C / 464 °F</td>
</tr>
<tr>
<td>Decomposition Temperature</td>
<td>No data available</td>
</tr>
<tr>
<td>Viscosity</td>
<td>2.4 mPa.s @ 20 °C</td>
</tr>
<tr>
<td>Explosive Properties</td>
<td>No information available</td>
</tr>
<tr>
<td>Oxidizing Properties</td>
<td>No information available</td>
</tr>
</tbody>
</table>

9.2. Other information

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Molecular Formula</td>
<td>C6 H9 N O</td>
</tr>
<tr>
<td>Molecular Weight</td>
<td>111.14</td>
</tr>
</tbody>
</table>

SECTION 10: STABILITY AND REACTIVITY

10.1. Reactivity None known, based on information available

10.2. Chemical stability Stable under normal conditions.

10.3. Possibility of hazardous reactions

- **Hazardous Polymerization**: Hazardous polymerization may occur in the presence of alcohols, acids, bases and amines.
- **Hazardous Reactions**: None under normal processing.

10.4. Conditions to avoid Incompatible products. Excess heat.
10.5. Incompatible materials

Strong oxidizing agents.

10.6. Hazardous decomposition products

Carbon monoxide (CO). Carbon dioxide (CO₂). Nitrogen oxides (NOₓ).

### SECTION 11: TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effects

**Product Information**

(a) acute toxicity;

- Oral: Category 4
- Dermal: Category 4
- Inhalation: Category 4

<table>
<thead>
<tr>
<th>Component</th>
<th>LD₅₀ Oral</th>
<th>LD₅₀ Dermal</th>
<th>LC₅₀ Inhalation</th>
</tr>
</thead>
<tbody>
<tr>
<td>N-Vinyl-2-pyrrolidone</td>
<td>1043 mg/kg  (Rat)</td>
<td>1040 mg/kg  (Rabbit)</td>
<td>LC₅₀ = 3070 mg/m³ (Rat) 4 h</td>
</tr>
</tbody>
</table>

(b) skin corrosion/irritation; No data available

(c) serious eye damage/irritation; Category 1

(d) respiratory or skin sensitization;

- Respiratory: No data available
- Skin: No data available

(e) germ cell mutagenicity; No data available

Not mutagenic in AMES Test

(f) carcinogenicity;

Category 2

The table below indicates whether each agency has listed any ingredient as a carcinogen

(g) reproductive toxicity; No data available

(h) STOT-single exposure; Category 3

(i) STOT-repeated exposure; Category 2

Target Organs

Eyes, Skin, Respiratory system, Liver.

(j) aspiration hazard; No data available

Other Adverse Effects

See actual entry in RTECS for complete information

Symptoms / effects, both acute and delayed

No information available

### SECTION 12: ECOLOGICAL INFORMATION
12.1. Toxicity
Ecotoxicity effects

Do not empty into drains. Contains a substance which is: Harmful to aquatic organisms. The product contains following substances which are hazardous for the environment.

<table>
<thead>
<tr>
<th>Component</th>
<th>Freshwater Fish</th>
<th>Water Flea</th>
<th>Freshwater Algae</th>
<th>Microtox</th>
</tr>
</thead>
<tbody>
<tr>
<td>N-Vinyl-2-pyrrolidone</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>EC50 = 45 mg/L 48h</td>
<td>EC50 = 780 mg/L 72h</td>
<td>EC50 = 4812 mg/L 17 h</td>
<td></td>
</tr>
</tbody>
</table>

12.2. Persistence and degradability

Persisted
Soluble in water, Persistence is unlikely, based on information available.

Degradation in sewage treatment plant
Contains substances known to be hazardous to the environment or not degradable in waste water treatment plants.

12.3. Bioaccumulative potential

Bioaccumulation is unlikely

<table>
<thead>
<tr>
<th>Component</th>
<th>log Pow</th>
<th>Bioconcentration factor (BCF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N-Vinyl-2-pyrrolidone</td>
<td>0.4</td>
<td>No data available</td>
</tr>
</tbody>
</table>

12.4. 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

12.5. Results of PBT and vPvB assessment

No data available for assessment.

12.6. Other adverse effects

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

13.1. Waste treatment methods

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.

European Waste Catalogue (EWC)
According to the European Waste Catalogue, Waste Codes are not product specific, but application specific.

Other Information
Do not dispose of waste into sewer. 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

IMDG/IMO
Not regulated

14.1. UN number
14.2. UN proper shipping name
14.3. Transport hazard class(es)
14.4. Packing group

ADR
Not regulated

14.1. UN number

ACR35473
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14.2. UN proper shipping name
14.3. Transport hazard class(es)
14.4. Packing group

IATA
Not regulated

14.1. UN number
14.2. UN proper shipping name
14.3. Transport hazard class(es)
14.4. Packing group

14.5. Environmental hazards
No hazards identified

14.6. Special precautions for user
No special precautions required

14.7. Transport in bulk according to
Annex II of MARPOL73/78 and the
IBC Code
Not applicable, packaged goods

SECTION 15: REGULATORY INFORMATION

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

International Inventories
X = listed.

<table>
<thead>
<tr>
<th>Component</th>
<th>EINECS</th>
<th>ELINCS</th>
<th>NLP</th>
<th>TSCA</th>
<th>DSL</th>
<th>NDSL</th>
<th>PICCS</th>
<th>ENCS</th>
<th>IECSC</th>
<th>AICS</th>
<th>KECL</th>
</tr>
</thead>
<tbody>
<tr>
<td>N-Vinyl-2-pyrrolidone</td>
<td>201-800-4</td>
<td>-</td>
<td>X</td>
<td>X</td>
<td>-</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>KE-1332</td>
<td>KECL</td>
</tr>
</tbody>
</table>

National Regulations

<table>
<thead>
<tr>
<th>Component</th>
<th>Germany - Water Classification (VwVwS)</th>
<th>Germany - TA-Luft Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>N-Vinyl-2-pyrrolidone</td>
<td>WGK 1</td>
<td>Class I : 20 mg/m³ (Massenkonzentration)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Component</th>
<th>France - INRS (Tables of occupational diseases)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N-Vinyl-2-pyrrolidone</td>
<td>Tableaux des maladies professionnelles (TMP) - RG 84</td>
</tr>
</tbody>
</table>

Take note of Control of Substances Hazardous to Health Regulations (COSHH) 2002 and 2005 Amendment.

15.2. Chemical safety assessment

A Chemical Safety Assessment/Report (CSA/CSR) has not been conducted

SECTION 16: OTHER INFORMATION

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

H302 - Harmful if swallowed
H312 - Harmful in contact with skin
H332 - Harmful if inhaled
H318 - Causes serious eye damage
H351 - Suspected of causing cancer
H335 - May cause respiratory irritation
H373 - May cause damage to organs through prolonged or repeated exposure

Legend
SAFETY DATA SHEET

N-Vinyl-2-pyrrolidone, stabilized

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
ENC5 - 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

ADR - European Agreement Concerning the International Carriage of Dangerous Goods by Road
IMOI/IMDG - International Maritime Organization/International Maritime Dangerous Goods Code
OECD - Organisation for Economic Co-operation and Development
BCF - Bioconcentration factor

Key literature references and sources for data
Suppliers safety data sheet, Chemadvisor - LOLI, Merck index, RTECS

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.

Creation Date 29-Apr-2010
Revision Date 26-Feb-2019
Revision Summary Not applicable.

This safety data sheet complies with the requirements of Regulation (EC) No. 1907/2006

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