GPS Safety Summary
1-vinyl-2-pyrrolidone

This Product Safety Summary is intended to provide a general overview of the chemical substance. It contains basic information and is not intended to provide emergency response information, medical information or treatment information. The summary cannot be relied on to provide in-depth safety and health information. In-depth safety and health information must be obtained from the Material Safety Data Sheet ((M)SDS) for the chemical substance.

Chemical Identity

Name: 1-vinyl-2-pyrrolidone
CAS number: 88-12-0
Molecular formula: C₆H₉NO

Structure

IUPAC name: 1-vinylpyrrolidin-2-one
BASF brand names: N-Vinyl-2-pyrrolidone

For synonyms see end of document

Uses and Applications

The N-Vinyl-2-pyrrolidone monomer is commonly used as a reactive diluent for radiation curing in UV-coatings, UV-inks and UV-adhesives, as well as a monomer for the production of water soluble Polyvinylpyrrolidone (PVP) with uses in oil-field, cosmetics and adhesives.
Health Information

Human Health Safety Assessment
Note: The information contained in the table below may be useful to someone handling the concentrated substance such as a manufacturer or transporter. Consumers are not likely to come in contact with the concentrated substance. The data does not replace the data given in the (M)SDS. For more information and recommended protective measures please refer to the (M)SDS.

<table>
<thead>
<tr>
<th>Effect Assessment</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute Toxicity</td>
<td>Of moderate toxicity after single ingestion.</td>
</tr>
<tr>
<td></td>
<td>Of pronounced toxicity after short-term skin contact and</td>
</tr>
<tr>
<td></td>
<td>after short-term inhalation.</td>
</tr>
<tr>
<td></td>
<td>The substance can be absorbed through the skin.</td>
</tr>
<tr>
<td>Irritation</td>
<td>Not irritating to the skin.</td>
</tr>
<tr>
<td></td>
<td>May cause severe damage to the eyes.</td>
</tr>
<tr>
<td></td>
<td>Causes temporary irritation of the respiratory tract.</td>
</tr>
<tr>
<td>Sensitization</td>
<td>Skin sensitizing effects were not observed in animal studies.</td>
</tr>
<tr>
<td>Mutagenicity</td>
<td>The substance was not mutagenic in bacteria and in animal tests.</td>
</tr>
<tr>
<td>Carcinogenicity</td>
<td>Indication of possible carcinogenic effect in animal tests.</td>
</tr>
<tr>
<td>Toxicity after repeated exposure</td>
<td>Danger of serious damage to health by prolonged exposure through inhalation.</td>
</tr>
<tr>
<td>Toxicity for reproduction</td>
<td>Not classified as toxic for reproduction.</td>
</tr>
<tr>
<td></td>
<td>Animal studies gave no indication of a developmental toxic effect at concentrations that were not toxic for parental animals.</td>
</tr>
</tbody>
</table>

Environmental Information

Environment Safety Assessment
Note: The information in this chapter is intended to provide brief and general information of this substance’s environmental impact. The results in the table below refer to testing performed with
the concentrated substance. The data does not replace the data given in the (M)SDS. For more information and recommended protective measures please refer to the (M)SDS.

<table>
<thead>
<tr>
<th>Effect Assessment</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aquatic Toxicity</td>
<td>Harmful to aquatic life.</td>
</tr>
<tr>
<td>Persistence and degradability</td>
<td>Readily biodegradable.</td>
</tr>
<tr>
<td>Bioaccumulation potential</td>
<td>Not bioaccumulative.</td>
</tr>
</tbody>
</table>

Physical/Chemical Properties

Phys/Chem Safety Assessment

- N-Vinyl-2-pyrolidone is a colorless to slightly yellow liquid. The substance is fully miscible with water. It is non-flammable and non-explosive.

Note: The results in the table below refer to testing performed with the concentrated substance. The data does not replace the data given in the (M)SDS. For more information and recommended protective measures please refer to the (M)SDS.

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical state</td>
<td>Liquid</td>
</tr>
<tr>
<td>Melting / freezing point</td>
<td>14 °C at 1013 hPa</td>
</tr>
<tr>
<td>Boiling point</td>
<td>218 °C at 1013 hPa</td>
</tr>
<tr>
<td>Flash point</td>
<td>95 °C (closed cup) to 100.5 °C (open cup) at 1013 hPa.</td>
</tr>
<tr>
<td>Flammability</td>
<td>Non-flammable</td>
</tr>
<tr>
<td>Explosive properties</td>
<td>Non-explosive</td>
</tr>
<tr>
<td>Self-ignition temperature</td>
<td>240 to 364 °C at 1013 hPa</td>
</tr>
</tbody>
</table>

Exposure Potential

- Workplace exposure: Exposure can occur either in a N-Vinyl-2-pyrolidone manufacturing facility or in the various industrial or manufacturing facilities that use N-Vinyl-2-pyrolidone. Those working with N-Vinyl-2-pyrolidone in manufacturing operations could be exposed during maintenance, sampling, testing, or other procedures. Each
manufacturing facility should have a thorough training program for employees and appropriate work processes, as well as safety equipment in place to limit unnecessary exposure. Exposure of the worker has been assessed. The occupational use of this substance is considered to be safe for the worker following the recommended safety measures given in the (M)SDS.

- **Consumer exposure:** There is no intended use in consumer products. Even though N-Vinyl-2-pyrolidone is used for the manufacture of contact lenses, due to it being a processing aid it does not become part of the produced article. Therefore, N-Vinyl-2-pyrolidone is of no concern for the health of consumers since consumers will not come into contact with harmful levels of N-Vinyl-2-pyrolidone. No indirect exposure via the environment is expected. Therefore, no relevant consumer exposure is expected.

- **Environmental exposure:** N-Vinyl-2-pyrolidone is readily biodegradable and will therefore be degraded within the wastewater treatment process. Though the substance is considered to be acutely harmful to aquatic organisms, a risk for the environment is not identified since exposure of surface waters is expected to be negligible due to the rapid degradation. N-Vinyl-2-pyrolidone does not accumulate in the food chain. Conclusively, all identified uses are safe for the environment based on the scientific facts summarized above and when carried out in compliance with recommended risk management measures and applicable regulations.

**Recommended Handling Measures**

*The recommended safety measures generally apply in contact with the concentrated substance. It is NOT intended to replace the comprehensive guidance found in the (M)SDS, only supplement it. Please refer to the (M)SDS for specific safety and first aid measures.*

When using concentrated chemicals always make sure that there is adequate ventilation. Always use appropriate chemical resistant gloves to protect your hands and skin and always wear eye protection such as chemical goggles. Do not eat, drink, or smoke where chemicals are handled, processed, or stored. Wash hands and skin following contact. If the substance gets into your eyes, rinse eyes thoroughly for at least 15 minutes with tap water and seek medical attention. For specific advice please consult the corresponding (Material) Safety Data Sheet of the substance.

All effluent releases that may include the substance must be directed to a (municipal) waste water treatment plant that removes the substance from the final releases to the receiving water.
Regulatory Information / Classification and Labeling

Under GHS substances are classified according to their physical, health, and environmental hazards. The hazards are communicated via specific labels and the (M)SDS. GHS attempts to standardize hazard communication so that the intended audience (workers, consumers, transport workers, and emergency responders) can better understand the hazards of the chemicals in use.

Note: The hazard statements and symbols presented here refer to the hazard properties of the concentrated substance and are meant to provide a brief overview of the substance’s labeling. It is not intended to be comprehensive or to replace information found in the (M)SDS.

Labeling according to UN GHS
UN GHS is the basis for country specific GHS labeling

Signal word:
Danger

Hazard statements:
H302: Harmful if swallowed.
H311: Toxic in contact with skin.
H331: Toxic 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.
H402: Harmful to aquatic life.

Additional information

1. IFA GESTIS-database on hazardous substances
   http://www.dguv.de/ifa/en/gestis/stoffdb/index.jsp

2. Information on registered substance (ECHA)

Most commonly used synonyms

» Vinylpyrrolidone
» 2-Pyrrolidinone, 1-ethenyl- (9CI)
» N-Vinylpyrrolidone
» Vinylpyrrolidone
» 1-Vinyl-2-pyrrolidinone
» 1-Vinylpyrrolidinone
» Vinylbutyrolactam
» N-Vinylpyrrolidinone
» 2-Pyrrolidinone, 1-vinyl- (7CI, 8CI)
» 1-Ethenylpyrrolidin-2-one

Disclaimer

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Contact

For further information on this substance or GPS safety summaries in general, please contact:
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