GPS Safety Summary
Urea

Chemical Identity

Name: Urea

CAS number: 57-13-6

Molecular formula: CH₄N₂O

Structure

IUPAC name:
Urea

BASF brand names:
Urea tech.
Urea tech. pure A
Urea tech. solution
AdBlue®

For synonyms see end of document

General

Urea plays an important role in many biological processes. In mammals urea is formed in the liver as end-product of the protein metabolism. About 80 - 90 % of the urea formed is then excreted by the kidney as a component of urine, a small amount of urea is excreted in sweat. The human body produces 20 – 30 g of urea per day.

Product Uses

Besides its use as an intermediate in the synthesis of various resins, adhesives and other chemicals large quantities of urea are used in the production of nitrogen-release fertilizers, due to it’s high content of nitrogen.
Benefits
Aqueous solutions of urea are used to completely convert nitric oxides in exhaust gases to nitrogen, e.g. AdBlue®, which is used in Diesel trucks and cars. Urea is the active component in instant cold packs used for first aid, and a component in dry fire extinguishers. Due to its low toxicity, urea is used as ingredient in skin creams which are able to rehydrate the skin, in dermatological creams for the treatment of psoriasis and other diseases of the skin. Due to its capability of dissolving hydrogen bonds, it is used to denaturate and clean proteins like insulin, used as a pharmaceutical.

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, while verifiable, are not intended to be comprehensive nor replace the data found in the (M)SDS.

<table>
<thead>
<tr>
<th>Effect Assessment</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute Toxicity</td>
<td>Virtually nontoxic after a single ingestion, short-term skin contact and short-term inhalation.</td>
</tr>
<tr>
<td>Irritation</td>
<td>Not irritating to the skin.</td>
</tr>
<tr>
<td></td>
<td>Not irritating to the eyes.</td>
</tr>
<tr>
<td>Sensitization</td>
<td>Not considered a sensitizer, since naturally present in skin.</td>
</tr>
<tr>
<td>Mutagenicity</td>
<td>The substance was not mutagenic in bacteria.</td>
</tr>
<tr>
<td>Carcinogenicity</td>
<td>In long-term studies in rats and mice in which the substance was given by feed, a carcinogenic effect was not observed.</td>
</tr>
<tr>
<td>Toxicity after repeated exposure</td>
<td>Repeated oral and dermal uptake of the substance did not cause substance-related effects.</td>
</tr>
<tr>
<td>Toxicity for reproduction</td>
<td>There are no indications for fertility impairing effects. No indications of a developmental toxic / teratogenic effect were seen in animal studies.</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 contained in this section explain the relative effect of the concentrated substance on the environment, as defined by certain tests.

<table>
<thead>
<tr>
<th>Effect Assessment</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aquatic Toxicity</td>
<td>With high probability acutely not 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

➢ Urea is a non flammable crystalline solid.

Note: The results in the table below refer to testing performed with the concentrated substance. It is not intended to be comprehensive or to replace information found in the (M)SDS.

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical state</td>
<td>Solid</td>
</tr>
<tr>
<td>Melting / freezing point</td>
<td>134°C</td>
</tr>
<tr>
<td>Boiling point</td>
<td>Not applicable, substance decomposes before boiling.</td>
</tr>
<tr>
<td>Flash point</td>
<td>Not applicable, substance decomposes.</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>Not applicable</td>
</tr>
</tbody>
</table>

Exposure Potential

➢ **Workplace exposure:** Based on the very low toxicity of urea exposure is considered to be without risk. Urea released during manufacturing or handling is of no concern for the
health of workers since it does not induce any adverse effects at relevant doses. Nevertheless, workers should follow the recommended safety measures in the Safety Data Sheet (SDS).

- **Consumer exposure**: Based on the very low toxicity of urea exposure is considered to be without risk. Urea released during handling is of no concern for the health of consumers since consumers will not come into contact with harmful levels of urea. Nevertheless consumer should always read product information before use and follow the label/use instructions.

- **Environmental exposure**: Urea is with high probability not harmful to aquatic organisms and hence the substance is not considered to pose an unacceptable risk for the environment. It will almost entirely be removed by biodegradation during waste water treatment processes. Insignificant amounts that may reach surface water will not exist in the environment for extended time periods due to degradation by microorganisms. 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 Labelling**
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 labelling. 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

The product does not require a hazard warning label in accordance with GHS criteria.

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)

3. OECD SIDS

Most commonly used synonyms

» Carbamid
» Carbonyl diamide

Disclaimer

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.

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Contact

For further information on this substance or GPS safety summaries in general, please contact: info.gps@basf.com