GPS Safety Summary

Zeolite

Chemical Identity

Name: Zeolite

CAS number: 1318-02-1

Molecular formula:
\( x \text{ MO} \cdot y \text{ SiO}_2 \cdot z \text{ Al}_2 \text{O}_3 \)
X can range from 0 to 0.5
Y can range from 0 to 0.5
Z can range from 0.5 to 1
\( M = \text{Na, K, Ca, NH}_4, \text{Fe, ...} \)

IUPAC name:
Zeolite

Structure

![Zeolite structure diagram](image)
Crystalline aluminosilicates, composed of silica (SiO2) and alumina (Al2O3), in various proportions plus metallic oxides. Produced by hydrothermal treatment of a solid aluminosilicate or of a gel obtained by the reaction of sodium hydroxide, alumina hydrate and sodium silicate. The initially obtained sodium aluminosilicate, or a naturally occurring analog, may be partially ion-exchanged to introduce other cations like potassium, calcium, ammonium, iron, ...

**Product Uses**

Generally zeolites are used in industrial and/or professional settings and have a wide dispersive use. Zeolites are used in production of adsorbents and chemical catalysts, mobile emission catalysts, clean air products, fertilizers, biocidal products, textile and leather products, paper and pulp, coatings and paints, washing and cleaning products, water treatment products and personal care products.

**Benefits**

Zeolites are characterized by their high surface area responsible for their exceptional adsorption properties and their anionic framework structure responsible for their ion exchange properties. There are many different crystalline types of zeolites, therefore the pore structure and size can be adjusted within wide ranges. The combination of these properties is unique in nature and therefore leads to a wide variety in applications.

**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><strong>Acute Toxicity</strong></td>
<td>Virtually nontoxic after a single ingestion, a single skin contact and by inhalation.</td>
</tr>
<tr>
<td><strong>Irritation</strong></td>
<td>Not irritating to the skin and the eyes.</td>
</tr>
<tr>
<td><strong>Sensitization</strong></td>
<td>Skin sensitizing effects were not observed in animal studies.</td>
</tr>
</tbody>
</table>
Mutagenicity
No mutagenic effect was found in various tests with bacteria and mammalian cell culture and in a test with mammals. The statement has been derived from products of a similar structure or composition.

Carcinogenicity
In long-term studies in rats in which the substance was given by feed, a carcinogenic effect was not observed.

Toxicity after repeated exposure
The substance may cause damage to the kidney after repeated ingestion of high doses, as shown in animal studies. Repeated inhalative exposure to high particle/dust concentrations may result in damage to the lungs.

Toxicity for reproduction
The results of animal studies gave no indication of a fertility or a developmental toxic / teratogenic effect. The statements have been derived from products of a similar structure or composition.

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 organisms.</td>
</tr>
<tr>
<td>Persistence and degradability</td>
<td>Inorganic substance, therefore biodegradation testing is not applicable.</td>
</tr>
<tr>
<td>Bioaccumulation potential</td>
<td>Accumulation in organisms is not to be expected.</td>
</tr>
</tbody>
</table>

Physical/Chemical Properties

Phys/Chem Safety Assessment

- Zeolite is a colorless and odorless solid UVCB (substance of unknown or variable composition) which does not have flammable or explosive properties.
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>&gt; 400 °C</td>
</tr>
<tr>
<td>Boiling point</td>
<td>Not applicable since it is an inorganic, inert substance with a high melting point.</td>
</tr>
<tr>
<td>Flash point</td>
<td>Not applicable</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 Zeolite exposure is considered to be without risk. Zeolite 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 extended Safety Data Sheet (eSDS).

- **Consumer exposure:** Based on the very low toxicity of Zeolite exposure is considered to be without risk. Zeolite released during handling is of no concern for the health of consumers since consumers will not come into contact with harmful levels of Zeolite.

- **Environmental exposure:** Zeolite is an inorganic substance and as such not readily biodegradable. Nevertheless, the substance is not considered to pose an unacceptable risk for the environment. It is with high probability not harmful to aquatic organisms and it is of low bioavailability. 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

Based on available data, labeling is currently not required.

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)

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

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