GPS Safety Summary
Silicon dioxide

Chemical Identity

Name: Silicon dioxide
CAS number: 7631-86-9
Molecular formula: O₂Si

Structure

\[ \text{Si} \quad \text{O} \quad \text{O} \]

IUPAC name: dioxosilane
BASF brand names:
- Emcor 66™
- KC-Trockenperlen®
- Novasil Plus
- Palusol®
- Perlkat®
- Sorbead®
- Telioform®

For synonyms see end of document

Product Uses

Silicon dioxide belongs to the class of synthetic amorphous silica (SAS). SASs have been commercialized since the 1950s, and they are currently used in a wide variety of industrial applications. SASs are usually tailor-made to meet the requirements of various users.

The main use of SAS is as reinforcement and thickening agent in various systems. Thus, SASs are incorporated into elastomers, resins, inks and water, for example. SASs exhibit a high absorption capacity due to their high porosity, therefore SASs are used as adsorbing agents. In coating for ink-jet paper, SAS absorbs large volumes of water from ink drops which lead to fast drying times. SASs are commonly used as support material on which the active compounds of a catalyst are deposited. This is also called a carrier for catalysts.

Further SASs are used as an adsorbent for automotive, chemical, natural gas processing, steel processing industry as well as power stations, electrical and packaging industries and laboratories.

SASs are also used in dry powder systems to enhance the flow properties, e.g. in powder coating and toner, where they do not occur isolated but bound to the surface of the corresponding powder particles.
SASs are also used in consumer products including cosmetics, pharmaceuticals and foods. Various SASs meet the requirements of international pharmacopoeias such as “Deutsches Arzneibuch”, US Pharmacopoeia and the European Pharmacopoeia in the current edition. Furthermore, SASs provide pastes and ointments with the desired consistency and inhibit separation of the components. In powdery products like cosmetic powder, salt and food powder, SASs provide the required flow properties as a flow aid. Finally, SAS is also used in beer and wine clarification.

**Benefits**

SASs are reinforcement and thickening agents in various systems. SASs exhibit a high absorption capacity due to their high porosity. SASs have been commercially successfully applied as a catalyst support for many years. The choice of the support is crucial for heterogeneous catalysis. SASs allow a fine dispersion of the active catalytic species on the surface of the support. SASs adsorbent are a high purity, beaded amorphous silica gel catalyst support. This type of substrate is determined by the nature of the reaction system. Its pore structure allows for controlled dispersion of the active catalytic metal on the surface. SASs adsorbents cost-efficiently minimize moisture, condensation, plugging and icing. They enhance end-product quality and extend process plant life cycles. The long life of the silicon dioxide beads reduces operating costs, while their high performance enhances the operating safety of natural gas pipelines, chemical manufacturing plants, electrical power stations and metal processing plants among others.

**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 single ingestion, after short-term skin contact and by inhalation.</td>
</tr>
<tr>
<td>Irritation</td>
<td>Not irritating to skin and eyes.</td>
</tr>
<tr>
<td>Sensitization</td>
<td>Not considered to be sensitizing after skin contact.</td>
</tr>
<tr>
<td>Mutagenicity</td>
<td>The substance was not mutagenic in bacteria, in mammalian cell cultures and in studies with animals.</td>
</tr>
</tbody>
</table>
Carcinogenicity

In long-term studies in animals in which the substance was given via the feed, a carcinogenic effect was not observed.

Toxicity after repeated exposure

Repeated inhalative uptake of particles/dust reaching the alveoli may cause damage to the lungs.

Toxicity for reproduction

Not considered to be toxic for reproduction.

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

- Silicon dioxide is a white odorless powder which is non-combustible and non-explosive.

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; 1700 °C at 1013 hPa</td>
</tr>
<tr>
<td>Boiling point</td>
<td>&gt; 1700 °C at 1013 hPa</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 self igniting</td>
</tr>
</tbody>
</table>

**Exposure Potential**

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

- **Environmental exposure:** Due to the inorganic nature of SASs biodegradation is per definition not possible. SASs are considered to be with high probability not harmful to aquatic organisms. Further, they do not accumulate in the food chain. Consequently, all identified uses are considered to be safe for the environment.

**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

2. Information on registered substance (ECHA)

3. BASF Productfinder
   [http://www.basf.com/group/corporate/en/Product-finder/index?pfs=d41d8cd98f0b24e980998ecf8427e&query=silicate&pfs_click=](http://www.basf.com/group/corporate/en/Product-finder/index?pfs=d41d8cd98f0b24e980998ecf8427e&query=silicate&pfs_click=)
Most commonly used synonyms

» Silica,

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