GPS Safety Summary
Hexafluorosilicic acid

Chemical Identity

Name: Hexafluorosilicic acid
CAS number: 16961-83-4
Molecular formula: $F_6Si.2H$

Structure

![Structure of Hexafluorosilicic acid](image)

Product Uses

Hexafluorosilicic acid is formed by dissolving or digesting rock phosphates, containing silicium dioxide ($SiO_2$) and fluoride, with nitric acid. Hexafluorosilicic acid is used in industrial settings as an intermediate for the manufacture of metals and chemicals and as a water and metal treatment chemical. Professional end uses include its application in washing and cleaning products and as laboratory chemicals.

Benefits

Hexafluorosilicic acid is marketed as aqueous solution only in concentrations between 5 and 45 wt %. The commercial product contains an excess of fluoride (minimum of 18,22 %) and may
also contain chloride, phosphate, sulfate, and traces of sulfur dioxide and metallic impurities (OECD SIDS).

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>The toxicity of the product is based on its corrosivity.</td>
</tr>
<tr>
<td>Irritation</td>
<td>Corrosive! Damages skin and eyes.</td>
</tr>
<tr>
<td>Sensitization</td>
<td>As the substance is corrosive, sensitization studies were not performed.</td>
</tr>
<tr>
<td>Mutagenicity</td>
<td>Mutagenicity tests revealed no genotoxic potential. The statements have been derived in parts from products of a similar structure or composition.</td>
</tr>
<tr>
<td>Carcinogenicity</td>
<td>The whole of the information available provides no indication of a carcinogenic effect. The statement has been derived from products of a similar structure or composition.</td>
</tr>
<tr>
<td>Toxicity after repeated exposure</td>
<td>After repeated administration the prominent effect is the induction of corrosion. The statements have been derived in parts from products of a similar structure or composition.</td>
</tr>
<tr>
<td>Toxicity for reproduction</td>
<td>The results of animal studies do not suggest a fertility impairing effect. No indications of a developmental toxic / teratogenic effect were seen in animal studies. The statements have been derived from products of a similar structure or composition.</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>Acutely harmful to aquatic organisms.</td>
</tr>
<tr>
<td>Persistence and degradability</td>
<td>Inorganic substance, therefore biodegradation testing is not applicable. In contact with water the substance will hydrolyze.</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**

- Hexafluorosilicic acid is a colorless, fuming liquid with a pungent odor. The substance is miscible with water. It 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>Liquid</td>
</tr>
<tr>
<td>Melting / freezing point</td>
<td>-16.6 °C (10 % solution)</td>
</tr>
<tr>
<td></td>
<td>-15.5 °C (25 % solution)</td>
</tr>
<tr>
<td></td>
<td>19.0 °C (60-70 % solution)</td>
</tr>
<tr>
<td></td>
<td>Decomposes upon heating</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-ignitable</td>
</tr>
</tbody>
</table>

**Exposure Potential**
➢ **Workplace exposure:** Due to the hazardous and corrosive nature of hexafluorosilicic acid, workers involved in production, handing, sampling and transfer of materials are trained in the procedures and protective equipment is intended to cope with the worst case scenario, in order to minimize exposure and risks. This may include chemical resistant clothing, goggles and respiratory equipment where required. Due to the nature of the materials the level of control is extremely high and so in reality exposure is highly unlikely. Primary emission sources are mostly not located in the breathing zone of the worker. The handling of hexafluorosilicic acid is such that contact between product and adjacent air is reduced and controlled loading is used reducing the amount of aerosol formation. Submerged loading may be used when needed. Vapor recovery systems and local exhaust ventilation such as enclosing hoods are used where required. Emission sources can be completely or partially segregated from the work environment by isolating the source in a fully enclosed and separate room and using complete personal enclosure with ventilation where necessary. The processes are generally fully enclosed (air tight) and the integrity of the enclosure is monitored. The facilities that are housed outdoors are generally not close to buildings and workers are generally located > 4 meters from far field source. The facilities that are housing indoors have good natural ventilation. Therefore, releases and subsequent worker exposure are unlikely. Nevertheless, workers should follow the recommended safety measures in the extended Safety Data Sheet (eSDS).

➢ **Consumer exposure:** There is no intended use of hexafluorosilicic acid in consumer products. The majority of uses involve chemical change in industrial settings, such that the hexafluorosilicic acid molecule no longer exists. This is also true for waste treatment, where excess hexafluorosilicic acid is generally neutralized and/or precipitated before downstream release. Therefore, a health hazard due to exposure for the consumer is negligible.

➢ **Environmental exposure:** Due to the inorganic nature of the chemical biodegradation is per definition not possible. Hexafluorosilicic acid is acutely harmful to aquatic organisms. The risk for the environment however is negligible because the substance is used as strictly controlled intermediate which is produced in closed systems. Thus, environmental emissions of the substance are extremely limited. Additionally, an exposure assessment has been performed in which it was demonstrated that releases to the environment by the identified uses do not pose an unacceptable risk. 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:
H314: Causes severe skin burns and eye damage.
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

» Fluosilicic acid (6Cl)
» Silicate(2-), hexafluoro-, dihydrogen (8Cl, 9Cl)
» Dihydrogen hexafluorosilicate(2-)
» Dihydrogen hexafluorosilicate
» Florosilicic acid
» Fluorsilicic acid (H2SiF6)
» Hexafluorosilicic acid
» Hydrofluorosilicic acid
» Hydrogen hexafluorosilicate (H2SiF6)
» Silicon hexafluoride dihydride

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