GPS Safety Summary
Iron/Iron Powder

Chemical Identity

Name: Iron
CAS number: 7439-89-6
Molecular formula: Fe

Structure

Fe

Product Uses

Iron is used in different forms in industrial settings (iron powders; pig iron, direct-reduced iron (DRI) and hot-briquetted iron (HRI) from furnaces, elementary iron and carbonyl iron powders). Iron powders, DRI, HRI and elementary iron are mainly used for production of metal articles. Elementary iron is also used for production of vehicles, machinery, mechanical appliances and electric/electronic articles. Carbonyl iron powders are used in many precision applications (powder injection molding for the production of automobile locks, clock parts, surgical instruments, etc...), in the production of electrical batteries and accumulators, in the manufacture of RFID (Radio-Frequency Identification) tags, in the textile industry, or even in paper and rubber articles production.

Benefits

Iron can be used for the manufacture of a wide range of products, and, when processed to a high degree of purity, can also be used in pharmaceuticals or as food additive.
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.</td>
</tr>
<tr>
<td>Irritation</td>
<td>Not considered to be irritating to skin and eyes.</td>
</tr>
<tr>
<td>Sensitization</td>
<td>Not considered to be sensitzing after skin contact.</td>
</tr>
<tr>
<td>Mutagenicity</td>
<td>Not considered to be mutagenic.</td>
</tr>
<tr>
<td>Toxicity after repeated exposure</td>
<td>The substance may cause damage to the lung after repeated inhalation of high doses.</td>
</tr>
<tr>
<td>Toxicity for reproduction</td>
<td>Not considered to be toxic for reproduction.</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 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

- Iron is a silver grey to grey or black, metallic bright solid. It is insoluble in water. In its powder form, iron is highly flammable 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>1150 - 1538 ºC (depending upon carbon content )</td>
</tr>
<tr>
<td>Boiling point</td>
<td>2861 ºC at 1013 hPa</td>
</tr>
<tr>
<td>Flash point</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Flammability</td>
<td>Highly flammable (powder form)</td>
</tr>
<tr>
<td>Explosive properties</td>
<td>Non-explosive</td>
</tr>
<tr>
<td>Self-ignition temperature</td>
<td>Risk of self-ignition (powder form)</td>
</tr>
</tbody>
</table>

Exposure Potential

- **Workplace exposure:** Based on the very low toxicity of iron exposure is considered to be without risk. Iron 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 iron exposure is considered to be without risk. Iron released during handling is of no concern for the health of consumers since consumers will not come into contact with harmful levels of iron. Nevertheless consumer should always read product information before use and follow the label/use instructions.
Environmental exposure: Iron is an inorganic substance which will not dissolve in water. The substance is with high probability not harmful to aquatic organisms and 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:
H228: Flammable solid.
H251: Self-heating: may catch fire.

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

» Iron (7CI, 8CI, 9CI)
» Carbonyl iron
» Sicopur FF 4068
» Carbonyl Iron Powder

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