GPS Safety Summary

Phosphoric acid

Chemical Identity

Name: Phosphoric acid
CAS number: 7664-38-2
Molecular formula: H₃O₄P

Structure

[Structure diagram]

Product Uses

Phosphoric acid is manufactured by dissolving or digesting rock phosphates with nitric acid (Odda-Process). The most common technical functions of phosphoric acid include its use in fertilizers, as food/feedstuff additives, as intermediates for synthesis of chemical products, as laboratory chemicals, as pH-regulating agents, as corrosion inhibitors and anti-scaling agents, as processing aid, as flame retardants and as degreasing agent. It is also used in metal surface treatment, acid cleaning agents, construction applications, detergents and cleaning agents and soldering agents. Consumer end uses include polishes and waxes, washing and cleaning products, soldering aids and fertilizers. Furthermore, phosphoric acid is used as additive for cosmetics and for drinks, beverages and food/feed stuff.

Benefits

Most of the phosphoric acid produced worldwide is used in the production of fertilizers (>75%). Phosphorus is one of the most important elements for the plants. Superphosphate was the
most widely used phosphorus fertilizer. In NPK-Fertilizer the use of Mono- and Di-Ammoniumphosphate is favored, because they contain both nitrogen and phosphorus in soluble form.

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 skin contact.</td>
</tr>
<tr>
<td></td>
<td>Of moderate toxicity after single ingestion.</td>
</tr>
<tr>
<td>Irritation</td>
<td>Corrosive! Damages skin and eyes.</td>
</tr>
<tr>
<td>Sensitization</td>
<td>As the substance is corrosive, conducting sensitization studies is not feasible.</td>
</tr>
<tr>
<td>Mutagenicity</td>
<td>No mutagenic effect was found in various tests with bacteria, microorganisms and mammalian cell culture. The substance was not mutagenic in tests with mammals.</td>
</tr>
<tr>
<td>Toxicity after repeated exposure</td>
<td>Based on available data the substance may lead to shifts in blood composition following repeated exposure in animal experiments.</td>
</tr>
<tr>
<td>Toxicity for reproduction</td>
<td>The results of animal studies gave no indication of a fertility impairing effect or a developmental toxic / teratogenic effect.</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</td>
</tr>
</tbody>
</table>
organisms.

### Persistence and degradability

Inorganic substance, therefore biodegradation testing is not applicable.

### Bioaccumulation potential

Accumulation in organisms is not to be expected.

### Physical/Chemical Properties

#### Phys/Chem Safety Assessment

- Phosphoric acid is a clear colorless/transparent solid but is mainly marketed as an aqueous liquid which is colorless and viscous. It does not have flammable or explosive properties. However in the presence of water or moisture the substance can be corrosive to metals.

*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>Hygroscopic solid</td>
</tr>
<tr>
<td>Melting / freezing point</td>
<td>41.1 °C at 1013 hPa</td>
</tr>
<tr>
<td>Boiling point</td>
<td>296.5 °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:** Phosphoric acid is a corrosive substance. For the handling of corrosive substances and formulations immediate dermal contacts occur only occasionally and accidentally (splashes, etc.) as wearing of gloves is mandatory, direct contact is forbidden and therefore it is assumed that repeated daily dermal exposure can be neglected. Generally, ocular exposure is possible due to eye hand contact. However, this is prevented as wearing of goggles is required. The risk management measures for human health should focus on the prevention of direct contact with the substance. For this reason automated and closed systems should preferably be used for industrial uses.
of phosphoric acid. Respiratory protection is needed when aerosols of phosphoric acid can be formed. Due to the corrosive properties appropriate skin and eye protection is required. Additionally, workers should follow the recommended safety measures in the extended Safety Data Sheet (eSDS).

- **Consumer exposure:** Phosphoric acid is not provided as such to consumers and general public. It is used in formulations which may be available to general public as various cleaning products, including polishes and waxes and some household fertilizers (garden products). In general terms the concentration of phosphoric acid in these products are very low and rarely exceed 10%. Furthermore, the amounts of phosphoric acid used in these mixtures will interact with other ingredients in acid-base reactions and thus only residues of phosphoric acid will remain as such in the final product. Nevertheless consumers should always read product information before use and follow the label/use instructions.

- **Environmental exposure:** Due to the inorganic nature of the chemical biodegradation is per definition not possible. Phosphoric acid is with high probability not acutely harmful to aquatic life and it does not accumulate in the food chain. However the substance can lead to pH changes in aquatic environments. Although the pH of effluents is usually measured frequently and a significant change of the pH of receiving waters is not expected because of neutralization measures, an exposure assessment has been performed additionally to show that aquatic organisms are sufficiently protected with regard to pH changes. 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:**

H290: May be corrosive to metals.
H303: May be harmful if swallowed.
H314: Causes severe skin burns and eye damage. (> 25 %)

**Additional information**

1. IFA GESTIS-database on hazardous substances

2. Information on registered substance (ECHA)
Most commonly used synonyms

» Phosphorsaure
» Phosphoric acid (7CI, 8CI, 9CI)
   Orthophosphoric acid

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