GPS Safety Summary

Ethylene

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. This information must be obtained from the Material Safety Data Sheet ((M)SDS) for this chemical substance. Before handling or using Ethylene the relevant (M)SDS has to be consulted.

Chemical Identity

Name: Ethylene

CAS number: 74-85-1

Molecular formula: C₂H₄

Structure

For synonyms see end of document

Product Uses

Ethylene, the most important basic chemical product, is mainly produced for the following uses: polyethylene for plastic films, plastic bottles, insulating material; ethylene dichloride (precursor for PVC) and for solvents (resins, asphalt, bitumen); as precursor for polystyrene (packaging) and as ethylene oxide (EO) for monoethylenglycol (MEG). In Europe ethylene is handled exclusively via pipeline and deep sea vessels.
Health Information

Human Health Safety Assessment

<table>
<thead>
<tr>
<th>Effect Assessment</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Acute Toxicity</strong></td>
<td>Virtually nontoxic by inhalation. Possible narcotic effects (drowsiness or dizziness).</td>
</tr>
<tr>
<td><strong>Irritation</strong></td>
<td>Ethylene is gaseous at room temperature and pressure, therefore, skin and eyes irritation is not expected. However, contact with liquid may cause frostbite.</td>
</tr>
<tr>
<td><strong>Sensitization</strong></td>
<td>Ethylene is gaseous at room temperature and pressure, therefore skin sensitization is not expected.</td>
</tr>
<tr>
<td><strong>Mutagenicity</strong></td>
<td>No mutagenic effect was found in various tests with bacteria and mammalian cell culture. The substance was not mutagenic in a test with mammals.</td>
</tr>
<tr>
<td><strong>Carcinogenicity</strong></td>
<td>In long-term animal studies in which the substance was given by inhalation, a carcinogenic effect was not observed.</td>
</tr>
<tr>
<td><strong>Toxicity after repeated exposure</strong></td>
<td>No substance-specific organotoxicity was observed after repeated administration of high doses to animals.</td>
</tr>
<tr>
<td><strong>Toxicity for reproduction</strong></td>
<td>The results of animal studies gave no indication of a fertility impairing effect. No indications of a developmental toxic / teratogenic effect were seen in animal studies. The statement has in part been derived from products of a similar structure or composition.</td>
</tr>
</tbody>
</table>

Note: For more information on the health hazards of this substance and recommended protective equipment, please refer to the relevant (M)SDS.
Environmental Information

Environment Safety Assessment

<table>
<thead>
<tr>
<th>Effect Assessment</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aquatic Toxicity</td>
<td>Ethylene is a gas and is extremely unlikely to reside in the aquatic compartment. Therefore, potential aquatic toxicity is not relevant.</td>
</tr>
<tr>
<td>Persistence and degradability</td>
<td>Readily biodegradable.</td>
</tr>
<tr>
<td>Bioaccumulation potential</td>
<td>Accumulation in organisms is not to be expected.</td>
</tr>
</tbody>
</table>

Note: For more information on the environmental hazards of this substance and recommended measures, please refer to the (M)SDS.

Physical/Chemical Properties

Phys/Chem Safety Assessment

- Ethylene is a colorless, flammable gas of sweetish odor. The substance is extremely flammable and non-explosive. Gas containers holding ethylene under pressure may explode if heated.

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical state</td>
<td>Gas</td>
</tr>
<tr>
<td>Melting / freezing point</td>
<td>-169 °C at 1013 hPa</td>
</tr>
<tr>
<td>Boiling point</td>
<td>-103.77 °C at 1013 hPa</td>
</tr>
<tr>
<td>Explosive limits</td>
<td>2.7 – 36 vol%</td>
</tr>
<tr>
<td>Flammability</td>
<td>Extremely flammable</td>
</tr>
<tr>
<td>Explosive properties</td>
<td>Non-explosive</td>
</tr>
<tr>
<td>Self-ignition temperature</td>
<td>450 °C</td>
</tr>
</tbody>
</table>

Note: For further information, see the relevant (M)SDS.
Exposure Potential

Ethylene is a chemical intermediate. Although BASF does not sell this substance for direct consumer use or directly to consumers, the public at large or consumers may be exposed to it from processing or use as a raw material for a variety of goods used by consumers or professionals. Based on the uses of this substance the public could be exposed through:

- **Workplace exposure:** Workers may come into contact with the substance in industrial settings during manufacture and transfer processes (e.g. during charging and discharging from/to vessels or large containers), during use as intermediate (manufacturing of other substances), use for formulations, use for polymer production and processing, use as fuel or functional fluid, and during use in laboratory. Industrially produced ethylene is, due to the physical state of the product, kept in closed systems during both production, storage and in further processing. Each manufacturing facility should have a thorough training program for employees and appropriate work processes, as well as safety equipment in place to limit unnecessary exposure. Safety showers and eye-wash stations should be accessible nearby. Workers should follow the recommended safety measures in the extended Safety Data Sheet (eSDS).

- **Consumer exposure:** Consumers may come in to contact with the substance during use as fuel or fuel additive. Carefully read and follow the instructions given on product labels for proper use.

- **Environmental exposure:** Ethylene is a gas, and due to its physico-chemical properties, volatility will play an important part as elimination route. This substance is not expected to have any significant toxicological effect on aquatic organisms, and a risk for the environment is not identified since exposure of surface waters is expected to be negligible due to the rapid evaporation from the aquatic environment. Further, ethylene does not accumulate in the food chain. Nevertheless, an exposure assessment was performed for the identified uses and resulted in releases that do not pose a risk for aquatic life. Consequently, all identified uses are considered to be safe for the environment.

Recommended Handling Measures

Before handling or using this substance, please consult the relevant (M)SDS. It contains the required handling measures, emergency response information, medical information or treatment information.
Regulatory Information / Classification and Labeling

Regulations exist that govern manufacture, sales, transportation, use and disposal of ethylene. These regulations may vary by city, state, country or geographic region. Information on these issues may be found in the relevant (M)SDS.

Ethylene was registered under REACH Regulation in the EU.

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.

Labeling according to UN GHS
UN GHS is the basis for country specific GHS labeling

Signal word:
Danger

Hazard statements:
H220: Extremely flammable gas.
H280: Contains gas under pressure; may explode if heated.
H336: May cause drowsiness or dizziness.

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

» Ethene (9CI)
» Ethylen
» Acetene
» Bicarburretted hydrogen
» Ethylene (8CI)

Disclaimer

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Contact

For further information on this substance or GPS safety summaries in general, please contact: info.gps@basf.com