GPS Safety Summary
Formaldehyde, oligomeric reaction products with aniline and phosgene

Chemical Identity

Name: Formaldehyde, oligomeric reaction products with aniline and phosgene

CAS number: 32055-14-4

Molecular formula: C₇H₄NO [C₈H₅NO]ₘ C₈H₆NO
m\text{mean} = 0.33\text{ (range }0.10 \text{ – 0.80)}

Structure

![Chemical Structure](OCN \quad \begin{array}{c}
\text{OCN} \\
\text{C} \\
\text{NCO}
\end{array})

Product Uses

MDI is widely used as Polyurethane component all over the world. Due to its chemical structure, it offers the processing of tailor made materials for a broad variety of applications. It can be used as pure substance or in its modified forms, as prepolymer or in its oligomeric/ polymeric form as such or as mixtures with those.

Formaldehyde, oligomeric reaction products with aniline and phosgene is used for the production of flexible and rigid foams. Furthermore, it is used for the production of elastomers and for composite materials. Formaldehyde, oligomeric reaction products with aniline and phosgene is also applied in the products of the coating, adhesive or sealant industries.

IUPAC name:
Formaldehyde, polymer with aniline and carbonyl dichloride

BASF brand names:
Crude MDI
Polymeric MDI

For synonyms see end of document
Benefits

Polyurethanes are rather a “niche polymer” in comparison to the big commodities. They are tailor made for special uses, where other products, can’t fulfill such high technical performance as Polyurethanes, due to their specific structure, such as e.g. Formaldehyde, oligomeric reaction products with aniline and phosgene. Their benefits are therefore unique technical performance and high sustainability.

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></td>
<td>Virtually nontoxic after short-term contact.</td>
</tr>
<tr>
<td></td>
<td>Of moderate toxicity after short-term inhalation.</td>
</tr>
<tr>
<td>Irritation</td>
<td>Irritating to skin and eyes.</td>
</tr>
<tr>
<td></td>
<td>Causes temporary irritation of the respiratory tract.</td>
</tr>
<tr>
<td>Sensitization</td>
<td>Sensitization after skin contact possible.</td>
</tr>
<tr>
<td></td>
<td>May cause sensitization of the respiratory tract.</td>
</tr>
<tr>
<td></td>
<td>Studies in animals suggest that dermal exposure may lead to pulmonary sensitization.</td>
</tr>
<tr>
<td>Mutagenicity</td>
<td>Not considered to be mutagenic.</td>
</tr>
<tr>
<td>Carcinogenicity</td>
<td>Indication of possible carcinogenic effect in animal tests following oral application. No indications for a carcinogenic effect in animal assays following inhalation exposure.</td>
</tr>
<tr>
<td>Toxicity after repeated exposure</td>
<td>After repeated inhalation exposure the most sensitive health effect is local irritation of the respiratory tract. As a result impairment of the olfactory epithelium was described in animal experiments, an effect which is not relevant to humans at occupational levels of exposure.</td>
</tr>
<tr>
<td>Toxicity for reproduction</td>
<td>No effects on reproductive organs have been reported in long term animal studies. No substance induced effects on development were observed at nontoxic dose levels in animal studies.</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>There is a high probability that the product is not acutely harmful to aquatic organisms.</td>
</tr>
<tr>
<td>Persistence and degradability</td>
<td>Not readily biodegradable. In contact with water the substance will hydrolyze slowly.</td>
</tr>
<tr>
<td>Bioaccumulation potential</td>
<td>Due to all available data accumulation in organisms is not to be expected.</td>
</tr>
</tbody>
</table>

Physical/Chemical Properties

Phys/Chem Safety Assessment

- Formaldehyde, oligomeric reaction products with aniline and phosgene is a brown, viscous organic liquid. It is hydrolytically unstable. The substance is non-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>Liquid</td>
</tr>
<tr>
<td>Melting / freezing point</td>
<td>5 °C at 1013 hPa</td>
</tr>
<tr>
<td>Boiling point</td>
<td>Substance decomposes above 300 °C.</td>
</tr>
<tr>
<td>Flash point</td>
<td>217.5 °C at 1013 hPa</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>&gt; 600 °C</td>
</tr>
</tbody>
</table>
Exposure Potential

- **Workplace exposure:** Exposure can occur either in a formaldehyde, oligomeric reaction products with aniline and phosgene manufacturing facility or in the various industrial facilities that use the substance. Those working with formaldehyde, oligomeric reaction products with aniline and phosgene in manufacturing operations could be exposed during maintenance, sampling, testing, or other procedures. 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:** Formaldehyde, oligomeric reaction products with aniline and phosgene is used i.e. in coatings, adhesives, and sealants. Based on the very low likelihood and frequency of consumer exposure and the use of proper protective gloves, it does not pose any hazard to the consumer. However, carefully read and follow the instructions given on product labels for proper use.

- **Environmental exposure:** Formaldehyde, oligomeric reaction products with aniline and phosgene will react with water to form carbon dioxide and insoluble polyurea compounds, which are not biodegradable but biologically inert. Because of this reaction, all unreactive methylenediphenyl diisocyanate release to the environment would be transformed when exposed to water. Further, Formaldehyde, oligomeric reaction products with aniline and phosgene has a low toxicity towards aquatic life. 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:
H315: Causes skin irritation.
H317: May cause an allergic skin reaction.
H319: Causes serious eye irritation.
H332: Harmful if inhaled.
H334: May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H335: May cause respiratory irritation.
H351: Suspected of causing cancer.
H373: May cause damage to organs through prolonged or repeated exposure.

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

» Carbonic dichloride, polymer with benzenamine and formaldehyde

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