GPS Safety Summary

N,N'-bis(2,2,6,6-tetramethylpiperidin-4-yl)hexane-1,6-diamine

Chemical Identity

Name: N,N'-bis(2,2,6,6-tetramethylpiperidin-4-yl)hexane-1,6-diamine

CAS number: 61260-55-7

Molecular formula: C_{24}H_{50}N_{4}

Structure

![Chemical Structure Image]

IUPAC name:
N,N'-bis(2,2,6,6-tetramethylpiperidin-4-yl)hexane-1,6-diamine

Product Uses

N,N'-bis(2,2,6,6-tetramethylpiperidin-4-yl)hexane-1,6-diamine is a monomer used as an intermediate under strictly controlled conditions for the manufacturing of specialty chemicals (HALS).

Benefits
Hindered-Amine Light Stabilizers (HALS) traps free radicals once they are formed by light and are effective in retaining surface properties such as gloss and prevent cracking and chalking of paints and plastics.

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>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>Skin sensitizing effects were not observed in animal studies.</td>
</tr>
<tr>
<td>Mutagenicity</td>
<td>The substance was not mutagenic in bacteria and in mammalian cell culture.</td>
</tr>
<tr>
<td>Toxicity after repeated exposure</td>
<td>After repeated exposure the prominent effect is local irritation. Potential systemic toxicity effects after oral exposure are considered secondary to the corrosive properties of the test substance.</td>
</tr>
<tr>
<td>Toxicity for reproduction</td>
<td>In animal studies the substance did not cause malformations. Fertility effects are not expected to occur.</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>Harmful to aquatic life. The substance has long lasting adverse effects to aquatic life.</td>
</tr>
</tbody>
</table>
Persistence and degradability | Poorly biodegradable.
---|---
Bioaccumulation potential | Not bioaccumulative.

**Physical/Chemical Properties**

**Phys/Chem Safety Assessment**

- The substance is a white powder which is soluble in water. It is non flammable, non explosive and has no oxidising properties

*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>61 °C</td>
</tr>
<tr>
<td>Boiling point</td>
<td>367 - 382 °C</td>
</tr>
<tr>
<td>Flash point</td>
<td>215.5 °C</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-ignited (of solid)</td>
</tr>
<tr>
<td></td>
<td>295°C (of liquid)</td>
</tr>
</tbody>
</table>

**Exposure Potential**

- **Workplace exposure:** Exposure can occur either in a N,N'-bis(2,2,6,6-tetramethylpiperidin-4-yl)hexane-1,6-diamine manufacturing facility or in the various industrial or manufacturing facilities that use N,N'-bis(2,2,6,6-tetramethylpiperidin-4-yl)hexane-1,6-diamine. Those working with N,N'-bis(2,2,6,6-tetramethylpiperidin-4-yl)hexane-1,6-diamine in manufacturing operations could be exposed during maintenance, sampling, testing, or other procedures. The human health hazard assessment of N,N'-bis(2,2,6,6-tetramethylpiperidin-4-yl)hexane-1,6-diamine resulted in the identification of skin corrosion and severe eye damage as the leading health effects. 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. The implemented Risk Management Measures (RMMs) and Operational Conditions (OCs) will ensure that worker exposure is reduced in a way that health hazard effects are avoided and that the risk due to skin corrosion and eye damage is considered to be adequately controlled. Furthermore, workers should follow the recommended safety measures in the extended Safety Data Sheet (eSDS).

- **Consumer exposure:** Due to the exclusive use of N,N'-bis(2,2,6,6-tetramethylpiperidin-4-yl)hexane-1,6-diamine in industrial settings, there is no intended use of N,N'-bis(2,2,6,6-tetramethylpiperidin-4-yl)hexane-1,6-diamine in consumer products. Therefore, an exposure for the consumer is negligible.

- **Environmental exposure:** N,N'-bis(2,2,6,6-tetramethylpiperidin-4-yl)hexane-1,6-diamine is classified as acutely and chronically harmful to aquatic life due to its toxicity to water organisms and its poor biodegradability. It does not accumulate in organisms. An exposure assessment was performed for the identified uses and resulted in releases that do not pose a risk to 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.

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**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.

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**Regulatory Information / Classification and Labeling**

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**Date of Issue:** March 2012
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](image)

**Hazard statements:**
H290: May be corrosive to metals.
H302: Harmful if swallowed.
H314: Causes severe skin burns and eye damage.
H402: Harmful to aquatic life.
H412: Harmful to aquatic life with long lasting effects.

**Additional information**

1. IFA GESTIS-database on hazardous substances

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

» 1,6-Hexanediamine, N,N'-bis(2,2,6,6-tetramethyl-4-piperidinyl)-

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