GPS Safety Summary

Substance Name:

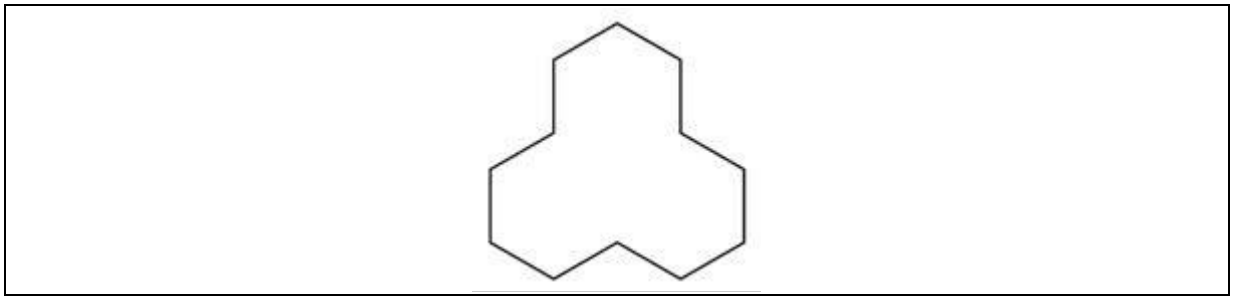
Cyclododecane

1. General Statement

Cyclododecane is a chemical substance used exclusively in industrial settings as an intermediate for the manufacture of various substances including the synthesis of Lauryllactam (or azacyclotridecane-2-one CAS RN 947-04-6) precursor for the manufacture of various polyamide/copolyamides. It must be used under strictly controlled conditions following Article 18(4) or REACH regulation 1907/2006/CE

2. Chemical Identity

Name: Cyclododecane
Chemical name (IUPAC): Cyclododecane
CAS number(s): 294-62-2
EC number: 206-033-9
Molecular formula: C12H24
Structure:



3. Use and applications

Cyclododecane is used exclusively in industrial settings as an intermediate in the manufacture of other substances.

4. Physical / Chemical properties

Cyclododecane is a white solid with the following physical/chemical properties:

Property	Value
Physical state	Solid
Form	Crystals
Colour	White
Odour	Musty
Molecular weight	168.32 g/mol

Density	0.855 g/cm^3 at 20°C
Vapour pressure	0,098 hPa at 20°C
Melting / boiling points	60.4°C / 244.03°C at 1013 hPa
Flammability	Not flammable
Flash point	95°C (molten form)
Explosive properties	Not explosive based on testing
Oxidizing properties	Not expected based on structure
Self-ignition temperature	225°C
Water solubility	16 µg/L at 20°C
Octanol-water partition coefficient (LogKow)	7.6 at 25°C

5. Health Effects

Effect Assessment	Result
Acute Toxicity Oral / inhalation / dermal	*Oral*: Based on the available test data, not expected to cause significant toxicity after acute oral exposure. *Inhalation and dermal*: No data
Irritation / corrosion Skin / eye/ respiratory tract	Based on the available test data, slightly irritant to skin and eye.
Sensitisation	Based on the available test data, not expected to cause allergic skin reactions.
Toxicity after repeated exposure Oral / inhalation / dermal	Based on the available test data, not expected to cause significant toxicity after repeated exposure.
Genotoxicity / Mutagenicity	Based on the available test data, not expected to cause adverse genetic effects in vitro.
Carcinogenicity	Not data.
Toxicity for reproduction	Not data.

6. Environmental Effects

Acute toxicity tests performed on Cyclododecane have shown no effect up to the limit of solubility which is very low. Cyclododecane is potentially bioaccumulabe and probably not biodegradable, but due to its particular properties (highly volatile and photodegradable), the substance is not expected to pose a risk to the environments compartments.

Effect Assessment	Result
Aquatic Toxicity	No effect up to the limit of solubility.
Fate and behaviour	**Result**
(Bio)degradation	Based on the available test data: not readily biodegradable but biodegradation is possible.
Bioaccumulation potential	Based on its bioconcentration factor, high potential for bioaccumulation.
PBT / vPvB conclusion	Suspected PBT

7. Exposure

7.1 Human health

General population will not come in contact with Cyclododecane as the substance is manufactured and used exclusively in industrial settings under strictly controlled conditions.

Worker exposure in facilities manufacturing or using the substance is not expected as worker activities are undertaken under strictly controlled conditions. Nevertheless if workers are exposed, during handling, loading, mixing, sampling or maintenance operations, they should follow the recommended safety measures in the extended Safety Data Sheet (e-SDS).

7.2 Environment

The manufacture and the use of Cyclododecane is under strictly controlled conditions and thus no exposure to the environment is expected. Nevertheless, if released to the environment, the main target compartment of Cyclododecane will be the atmosphere followed by sediment and soil. Atmospheric OH sensitized photodegradation and biodegradation are expected to be the predominant ways of removal from the environment.

Even though the substance has a high potential for bioaccumulation, Cyclododecane is not expected to pose a risk to the food chain as releases to the environments are not expected and the substance evaporates quickly from aquatic systems.

8. Risk Management recommendations

<table>
<tr><th colspan="3">Human health measures</th></tr>
<tr><td>Organizational</td><td colspan="2">Implement good basic standards of occupational hygiene.
Ensure operatives are well informed of the hazards and trained to minimise exposures.
Refer to the latest available extended safety data sheet (eSDS).</td></tr>
<tr><td>Engineering controls</td><td colspan="2">Use material of high integrity for loading and unloading.
Investigate engineering techniques to reduce exposures.
Ensure sufficient air exchange and/or exhaust in work areas,
Routine monitoring and inspections for leaks to reduce fugitive emissions.
Ensure that eye- and handwash stations and safety showers are close to workstation locations.</td></tr>
<tr><td rowspan="4">Protection</td><td>Eye/Face protection:</td><td>Safety glasses</td></tr>
<tr><td>Skin protection:</td><td>Protective clothing (product handled in molten state)</td></tr>
<tr><td>Hand protection:</td><td>Gloves (product handled in molten state)</td></tr>
<tr><td>Respiratory protection:</td><td>In case of insufficient ventilation, wear suitable respiratory equipment.</td></tr>
<tr><th colspan="3">Environment protective measures</th></tr>
<tr><td colspan="3">On-site waste water treatment is required.
Do not release into the environment. Do not let product enter drains. Dam up with inert material. Destroy absorbed product in accordance with local and national regulations.</td></tr>
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9. Regulatory Information / Classification and Labelling

9.1 Regulatory Information

This substance has been registered under:

- EU Regulation EC 1907/2006 (REACH)

9.2 Classification and labelling

Under GHS substances are classified according to their physical, health, and environmental hazards. The hazards are communicated via specific labels and the eSDS. 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. Substances registered for REACH are classified according CLP (EC) 1272/2008, implementation of the GHS in the European Union.

Classification	
According to REGULATION (EC) no 1272/2008: - Not classified	
Pictogram	
- None	
Hazard statement	
- None	
Additional classification according Global Harmonized System (GHS)	
- None	

10. Contact Information within Company

For further information on this substance or product safety summary in general, please contact:

- arkema.reach-dpt1@arkema.com
- **ICCA portal where the GPS Safety Summary is posted**: http://www.icca-chem.org/en/Home/ICCA-initiatives/global-product-strategy/

11. Date of Issues / Revision

- Date of issue: 2013/03/11
- Date of revision:

12. Disclaimer

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