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GPS Safety Summary - CYCLOHEXANE

SUBSTANCE NAME

CYCLOHEXANE

CHEMICAL IDENTITY

Name: CYCLOHEXANE
Chemical name (IUPAC): CYCLOHEXANE
CAS number: 110-82-7
EC number: 203-806-2
Molecular formula: C_6H_{12}

Structure:

USES AND APPLICATIONS

Cyclohexane is mainly use as a synthesis intermediate product, in the manufacture of nylon.
Cyclohexane may be present in some consumer products (e.g. coatings, cleaning agents, paints, fuel).

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PHYSICAL/CHEMICAL PROPERTIES

Phys/Chem Safety Assessment

Property	Value
Physical state (at 20°c)	Liquid
Colour	Colourless
Odour	Solvent
Density (at 25°C)	778 kg/m³
Melting / boiling point	6.5°C/81°C
Flammability	H225 - Highly flammable liquid and vapour
Explosive properties	Explosion limits (% vol) : upper = 8.4 ; lower = 1.3
Self-ignition temperature	260°C
Vapor pressure	124hPa at 24°C
Mol weight	84 g/mol
Water solubility	Non miscible
Flash point	-20°C (ASTM D 93)
Octanol-water partition coefficient (LogKow) (at 20°C)	3.44

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HEALTH EFFECTS

Human Health Safety Assessment

Effect Assessment	Result
Acute Toxicity	**Inhalation** : high levels of exposure may cause headache, drowiness, nausea
Local effect	**Irritating to skin:** may cause skin irritation and dermatitis due to the defatting properties of the product
	Eye contact : contact with the liquid or exposure to vapours can be irritating to eyes
Sensitisation	Not regarded as a sensitiser
Toxicity after repeated exposure	**Inhalation :** no significant toxic effects in animals after repeated exposure to high concentrations; no significant toxic potential expected in human
Genotoxicity / Mutagenicity	Non-genotoxic
Carcinogenicity	Not considered as carcinogen
Reproductive toxicity	No toxic effect on fertility nor on fœtal development in animals
Aspiration hazard	In case of accidental swallowing, due to its low viscosity, the product may be aspired into the lung and induce a chemical pneumonitis developing over a few hours

ENVIRONMENTAL EFFECTS

Environment Safety Assessment

Cyclohexane is very toxic to aquatic organisms. Based on its high vapour pressure and Henry's law constant, Cyclohexane is expected to volatilize from surface waters. It is considered readily biodegradable. The product is not considered to be either persistent and bioaccumulative, nor very persistent and very bioaccumulative.

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EXPOSURE

Human health

Consumer: consumers may be exposed to Cyclohexane as a component of certain products (such as cleaning agents, coatings, and/or fuel). Based on model calculations, exposure will be below safe exposure levels as operation conditions and risk management measures recommended into the Safety Data Sheet (SDS) must be applied.

Worker: Cyclohexane is mainly used either in closed process with no likelihood of exposure or in closed continuous process with occasional situations where controlled exposure can occur. Workers may be exposed to Cyclohexane during, for example, product transfer operations, product sampling, or maintenance/repair activities. Exposure is minimized as operation conditions and management measures recommended into the SDS must be applied.

Environment

Exposure to the environment may take place during production, formulation, distribution of Cyclohexane, and when consumer or workers use products containing Cyclohexane. Based on model calculations and specific information from facilities manufacturing and using Cyclohexane, Cyclohexane would not pose concern for the environment if the risk management measures recommended into the SDS are applied.

RISK MANAGEMENT RECOMMENDATIONS

Always handle the product in accordance with good industrial hygiene and safety procedures and apply risk management measures recommended into SDS. -Workers must use appropriate Personal protective equipment (PPE) such as gloves, goggles, safety shoes, respiratory protective equipment, etc…, especially, during operations where emission may occur, like product transfer operations, product sampling, or maintenance/repair activities. When using the product, avoid producing or diffusing fumes, vapour or spray into the air, avoid splashes, avoid contact with skin and eyes. As the product may form flammable / explosive vapor-air mixture, all possible sources of ignition must be removed. When using, do not eat, drink or smoke. If swallowed, rinse mouth with water, and do not induce vomiting. In case of eye or skin contact, rinse immediately with plenty of water, for at least 15 minutes, and get medical advice.

Specific risk management measures are reported for each identified use in the SDS.

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STATE AGENCY REVIEW

- This substance has been registered under REACH (EC) 1907/2006.
- This substance has been evaluated under OECD HPV program.

REGULATORY INFORMATION / 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 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. Substances registered for REACH are classified according CLP (EC) 1272/2008.

Classification of the substance

EC-GHS (CLP) Classification according to the regulation EC 1272/2008 (EC-GHS) and ATP

Flam. Liq. 2
Asp. Tox. 1
Skin Irrit. 2
STOT SE 3
Aquatic Acute 1
Aquatic Chronic 1

Pictogram(s) GHS02, GHS07, GHS08, GHS09

H Phrase(s)

H225 - Highly flammable liquid and vapour.
H304 - May be fatal if swallowed and enters airways.
H315 - Causes skin irritation.
H336 - May cause drowsiness or dizziness.
H400 - Very toxic to aquatic life.
H410 - Very toxic to aquatic life with long lasting effects.

P Phrase(s)

P201 - Obtain special instructions before use.
P210 - Keep away from heat/sparks/open flames/hot surfaces. — No smoking.
P243 - Take precautionary measures against static discharge.
P260 - Do not breathe dust/fume/gas/mist/vapours/spray.
P273 - Avoid release to the environment.
P280 - Wear protective gloves/protective clothing/eye protection/face protection.
P301/310 - IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
P331 - Do NOT induce vomiting.
P303/361/353 - IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
P309/311 - IF exposed or if you feel unwell: Call a POISON CENTER or doctor/physician.
P403/235 - Store in a well-ventilated place. Keep cool.

CONCLUSION

- Cyclohexane is mainly used as a synthesis intermediate product for the manufacture of nylon. It may also be present in some consumer products (such as e.g. coatings, cleaning agents, paints, fuel).
- Short exposure to high levels of Cyclohexane may cause toxic effects. Cyclohexane is very toxic for aquatic organism.
- Exposure to humans and the environment is considered low if properly handled.

CONTACT INFORMATION WITHIN COMPANY

For further information on this substance or product safety summaries in general, please contact: pch.reach@total.com

Or visit the ICCA portal on: http://www.icca-chem.org/en/Home/ICCA-initiatives/global-product-strategy/

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GLOSSARY

Acute Toxicity	Harmful effect resulting from a single or short term exposure to a substance
Biodegradation	Decomposition or breakdown of a substance under natural conditions (actions of micro organisms etc)
Bioaccumulation	Progressive accumulation in living organisms of a chemical substance present in the environment
Carcinogenicity	Substance effects causing cancer
Genotoxicity	Substance effect that causes damage to genes, including Mutagenicity and clastogenicity
GHS	Global Harmonized System of chemicals classification
Hazard	Inherent substance property bearing a threat to health or environment
Mutagenicity	Substance effect that cause mutation on genes
Persistence	Refers to the length of time a compound stays in the environment, once introduced
Reprotoxicity	Including teratogenicity, embryotoxicity and harmful effects on fertility
Sensitising	Allergenic

DISCLAIMER

The information contained in this paper is intended as basic advice and general information to this designated specific product (substance) only and whilst this information is provided in utmost good faith and has been based on the best information to our belief and to our knowledge currently available, it is to be relied upon at the user's own risk. The information in this paper is not intended to provide medical or medical emergency response information, nor treatment information; all detailed safety and health information is to be found in the Safety Data Sheets (SDS) for the product (substance) concerned and to be consulted before use of this product (substance). The information in this Safety Summary is not replacing the SDS and is not automatically applicable if this product (substance) is used with other products (substances) or in other processes.

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