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Product Stewardship Summary
Cyclohexane

The product stewardship summary is intended to give general information about the chemical or categories of chemicals addressed. It is not intended to provide an in-depth discussion of all health and safety information. Additional information on the chemical is available through the applicable Safety Data Sheet (SDS). Please consult the SDS before use of the chemical. The product stewardship summary does not supplant or replace required regulatory and/or legal communication documents.

Chemical identity:
Cyclohexane is a cycloalkane and volatile organic chemical. It occurs naturally in petroleum crude oil, volcanic gases and cigarette smoke. Nearly all industrial cyclohexane is produced by benzene hydrogenation.

Chemical Formula: C_6H_{12}
CAS Number: 110-82-7
Chemical Structure:

Synonyms：Hexamethylene, hexanaphthene, hexahydrobenzene

Product Uses:
Most cyclohexane goes into the production of intermediates for nylon, which has a variety of common applications such as clothing, tents and carpets, as well as thermoplastics. Cyclohexane is also used as a solvent in chemical and industrial processes and recently has been substituted for benzene in many applications.

Physical/chemical properties:
Cyclohexane is a clear colorless liquid with mild sweet odor at room temperature. Cyclohexane is a highly flammable chemical. Cyclohexane is not considered a highly reactive material.

Health Information:
Cyclohexane is expected to have low toxicity via the oral, dermal, and inhalation routes. Cyclohexane is considered a skin irritant and is a slight irritant to eyes and respiratory tract. The low viscosity of cyclohexane presents a potential aspiration hazard. Reversible acute central nervous system depression or possible minimal kidney or liver effects may occur at levels well above the OSHA Permissible Exposure Level (PEL), 300 ppm. There is no evidence that cyclohexane causes genetic or long-term adverse effects nor are reproductive effects, developmental toxicity, sub-chronic toxicity or neurotoxicity expected at exposure levels at or below the OSHA PEL. Occupational exposure is routinely well below the OSHA PEL. Non-

occupational exposures to cyclohexane are very low. Thus, health risks from routine occupational and non-occupational exposure are low. At exposure levels above 300 ppm in air or with direct contact that might occur following an inadvertent release or improper handling, there is some risk of reversible short-term health effects.

Environmental Information:
Cyclohexane is toxic to aquatic organisms, but is not expected to concentrate in biological tissues. Cyclohexane's persistence in water is expected to be low and depending on soil characteristics, persistence in soil is expected to be low to medium. Cyclohexane is expected to readily biodegrade in aquatic systems. Actual environmental exposure is often significantly lower than levels shown to cause effects.

Exposure Potential:

- *Workplace use:* This refers to potential exposure to cyclohexane to persons in a manufacturing facility or through various industrial applications. Occupational exposure to cyclohexane is expected to be low because cyclohexane is typically manufactured, processed, stored and transported in closed systems with low potential of release.

- *Consumer use:* Non-occupational exposure to cyclohexane is expected to be very low because most of the cyclohexane produced is used in the synthesis of other substances within the chemical industry and does not reach consumers. However, consumer exposure may occur where cyclohexane is used as a solvent in paints, spray adhesives, ballpoint ink and other household products, though it is not expected to be significant or prolonged. Non-occupational exposure to cyclohexane can also occur because the chemical is a component of motor vehicle exhaust and cigarette smoke, as well.

- *Potential environmental release:* Cyclohexane may be released into the environment from natural sources (crude oil, plants), combustion products (cigarette smoke, volcanic emissions), or petroleum derived fuels (gasoline vapors). Also, cyclohexane is lost from surface water and soil by volatilization to air where it is degraded. Cyclohexane, which is not volatilized, is expected to have low to moderate persistence in soil. Chevron Phillips Chemical Company LP is committed to operating in an environmentally responsible manner and has adopted the American Chemistry Council's Responsible Care® initiative.

Risk Management:
Chevron Phillips Chemical is committed to product stewardship and doing business responsibly. We endeavor to provide sufficient information for the safe use and handling of all our products. To that end, the SDS and certificate of analysis on cyclohexane are provided to customers. In addition, we have completed a product risk assessment to evaluate the potential risks associated with the distribution and use of cyclohexane. We also have available for our business partners an in-depth guide to the safe handling & storage of cyclohexane. Before using cyclohexane, the user is advised and cautioned to make its own determination and assessment of the safety and suitability of the product for the specific use in question. It is the ultimate responsibility of the user to ensure suitability for use and determine if this information is applicable to the user's specific application. Chevron Phillips Chemical does not make, and expressly disclaims, all warranties, including warranties of merchantability or fitness for a particular purpose, regardless of whether oral or written, express or implied, or allegedly arising from any usage of any trade or from any course of dealing in connection with the use of the information contained herein or any product itself. The user expressly

assumes all risk and liability, whether based in contract, tort or otherwise, in connection with the use of the information contained herein or any product itself.

Regulatory Information:
Regulations exist that govern the manufacturing, sale, transportation, use and/or disposal of cyclohexane. These regulations may vary by city, state, country or geographic region. Additional helpful information may be found by consulting the relevant product SDS.

Sources of Additional Information:

- European Aromatics Producers Association – Aromatics: Improving the Quality of Your Life: https://www.aromaticsonline.eu/applications
- U.S. Environmental Protection Agency (USEPA) – Integrated Risk Information System (IRIS): https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=1005
- U.S. Environmental Protection Agency (USEPA) – Cyclohexane fact sheet and chemical summary: http://www.epa.gov/chemfact
- EU Risk Assessment and Summary Reports on Cyclohexane (2004): https://echa.europa.eu/documents/10162/d99cee39-82e6-4754-aac1-497106c9bd7c
- Organization for Economic Cooperation and Development (OECD) – eChemPortal web-based search tool (use applicable CAS No.): http://www.echemportal.org/
- European Chemicals Agency (ECHA) – Information on Registered Substances: https://echa.europa.eu/information-on-chemicals/registered-substances http://apps.echa.europa.eu/registered/registered-sub.aspx
- Our aromatics product website: https://www.cpchem.com/what-we-do/solutions/aromatics
- Our product information webpage for cyclohexane: https://www.cpchem.com/what-we-do/solutions/aromatics/products/cyclohexane

Conclusion:
Cyclohexane is commonly used as a feedstock for industrial chemical manufacturing. It is highly flammable. Acute toxicity is low at typical exposure levels; however, high levels of exposure for short or long periods may cause skin irritation, headaches and other reversible central nervous system effects ranging from dizziness to unconsciousness. Cyclohexane is not expected to cause adverse environmental effects at levels typically found in the workplace or environment, however, prior to use or handling cyclohexane, make sure to consult the relevant product SDS and review applicable regulatory guidelines and requirements, including but not limited to OSHA guidelines.

Contact Information:
http://www.cpchem.com/

Date: Dec. 1, 2020