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Product Stewardship Summary
C_8-C_{12} MERCAPTAN PRODUCTS

This 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 is available through the applicable Safety Data Sheet (SDS) which should be consulted before use of any chemical. This product stewardship summary does not supplant or replace required regulatory and/or legal communication documents.

Chemical Identity

The products in the C_8-C_{12} Mercaptan category are straight or branched aliphatic thiols with a carbon number of C_8 through C_{12}. They are colorless liquids with a strong repulsive or pungent odor. In general, these products exhibit similar physical and chemical characteristics. They tend to have low volatility and vapor pressure. They also have low combustible characteristics, and are not reactive products. These products are generally incompatible with oxygen and strong oxidizing agents, such as chlorates, nitrates, and peroxides. Overall, products within this group exhibit similar health and environmental hazards; however with varying degrees of severity.

Product Uses

C_8-C_{12} Mercaptan products are typically used as additives, agricultural, chemical, and pharmaceutical intermediates, polymerization chain transfer agents, anti-oxidants, and UV absorbers. Products in this group are commercially available to industrial customers only, which typically include plastic and rubber manufacturers, lubricant manufacturers, and health and pharmaceutical companies.

Physical/Chemical Properties

While the C_8-C_{12} Mercaptan products are considered low combustible liquids, they do have the potential to cause fires if they are exposed to an ignitable source. The formation of hazardous

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Before using these products, the user is 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 Company and its affiliates do 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.

combustible or decomposition byproducts such as sulfur and carbon oxides is possible. However, these products are typically stable under normal ambient and anticipated storage and handling conditions of temperature and pressure. These products should be kept in a cool and well-ventilated place, away from ignitable sources such as heat, sparks, open flames, or hot surfaces.

Health Information

C_8-C_{12} Mercaptan products have low acute toxicity. Symptoms of overexposure may include respiratory irritation, central nervous system (CNS) effects, including dizziness, headache, nausea, and loss of coordination. If ingested, these products may be aspirated into the lungs, which can result in severe pulmonary damage (*e.g.*, pneumonitis or inflammation). Irritation of the mouth, throat, and stomach may also occur, if ingested. Dermal and eye contact with some of these products can cause irritation and even corrosion (*i.e.*, *n*-Dodecyl Mercaptan and *n*-Decyl Mercaptan). C_8-C_{12} Mercaptan products are skin sensitizers that can cause an allergic skin reaction. Repeated exposure of laboratory animals to some of these products has shown effects in the liver and kidney at high vapor concentrations, and liver and red blood cell (hemolytic anemia) effects at high oral doses. The kidney effects mentioned above are specific to the tested animal species and are not considered relevant to humans. The effects seen in these laboratory animal studies were at exposures that are not likely to occur in humans from anticipated use of the products. Data are unavailable to adequately characterize their potential to cause cancer in humans; however, genetic toxicity data were negative for the products tested, which is suggestive of a low potential to cause cancer. Available data show little to no evidence for their potential to cause reproductive, teratogenic or developmental toxicity effects.

Environmental Information

The hazard potential for the C_8-C_{12} Mercaptan products to aquatic organisms is high with the exception of Sulfole® 120 Mercaptan. This product is not expected to cause toxicity at the limit of water solubility nor bioaccumulate. These products also demonstrate a general tendency to persist in the environment (i.e. not expected to be readily biodegradable), and the octanol-water partition coefficients (log Kow) for some products are suggestive of the potential to bioaccumulate. Due to the potential of these chemicals to cause significant harm to aquatic environments, care must be taken to avoid releases of these products to sewage, drainage systems and water bodies. Spillage shall be quickly collected in the event of an accidental release.

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Exposure Potential

The most likely routes of exposure to the C_8-C_{12} Mercaptan products are skin and eye contact, and potentially via inhalation because these products have low vapor pressures. The best way to prevent exposure is to work in well-ventilated areas, wear appropriate personal protective equipment (PPE), and follow good personal hygiene practices.

Workplace Use:

Potentially exposed populations include: (1) workers who manufacture and/or blend these products; (2) quality assurance workers who sample and analyze the products to ensure that they meet specifications; (3) workers involved in distribution and storage of these products; and (4) commercial consumers in occupational settings that use these products in intended applications. The probability of exposure to workers is expected to be low because these products are manufactured in enclosed, controlled environments, and are transported in tightly sealed containers. These products are sold to industrial customers that are familiar with their intended applications, safe handling, storage, and disposal requirements. Manufacturing, quality assurance, and transportation workers should always adhere to safe handling practices and wear appropriate personal protective equipment (PPE). Due to the low odor thresholds of these products (e.g., the odor threshold for n-Dodecyl Mercaptan is 0.25 parts per billion; ppb), leaks can be detected quickly, and prolonged exposures can be avoided. Additionally, they have access to exposure prevention measures (e.g., engineering controls). Customers should also use appropriate PPE during handling and have risk mitigation measures in place to address potential physical hazards or accidental releases.

Consumer Use:

Potential exposure or impact to the general public is not anticipated for these products, as they are sold by Chevron Phillips Chemical Company to sophisticated industry users and not to the general population.

Potential Environmental Release:

There may be some potential for exposure to the environment from accidental releases during transportation via truck trailers, railcars, or container ships; however, the frequency of distribution incidents involving accidental releases of these products has been low, and reported product volumes spilled have been minimal. Chevron Phillips Chemical Company is

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committed to operating in an environmentally responsible manner and has adopted the American Chemistry Council's Responsible Care® initiative.

Risk Management

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Regulatory Information

Regulations exist that govern the manufacture, sale, transportation, use and disposal of the C_8-C_{12} Mercaptan products. These regulations may vary by city, state, country or geographic region. Additional relevant information may be found by consulting the applicable SDS.

Sources of Additional Information

Safety Data Sheets (SDS) at http://www.cpchem.com:

- N-Octyl Mercaptan
- T-Nonyl Mercaptan (Sulfole® 90 Mercaptan)
- N-Decyl Mercaptan
- N-Dodecyl Mercaptan
- t-Dodecyl Mercaptan (Sulfole® 120/ Sulfole® 120B Mercaptan)
- Sulfole® 100 Mercaptan

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European Chemical Agency (ECHA) Dissemination portal with information on chemical substances registered under REACH

- http://echa.europa.eu/information-on-chemicals.

Organization for Economic Cooperation and Development (OECD): eChemPortal web-based search tool

- https://www.echemportal.org/echemportal/

Conclusion

The C_8-C_{12} Mercaptan products are classified as hazardous chemicals. Efforts should be taken to minimize exposure to these products by adhering to safe-handling procedures, designated applications and uses, appropriate personal-protective equipment practices, and appropriate labeling, storage, and transportation procedures and requirements. The relevant SDS and applicable regulatory guidelines and requirements, including but not limited to Occupational Health and Safety Administration (OSHA) guidelines, should be consulted prior to the use or handling of these products.

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

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