



Product Stewardship Summary C₈-C₁₂ MERCAPTAN PRODUCTS

The product stewardship summary is intended to give general information about the chemical or categories of chemicals addressed in the document. It is not intended to provide an in-depth discussion of all health and safety information related to the chemicals or the products included in this summary. Additional information is available through the applicable Material Safety Data Sheet (MSDS) 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 C₈-C₁₂ Mercaptan category are straight or branched aliphatic thiols with a carbon number of C₈ through C₁₂. They are colorless liquids with a strong repulsive or pungent odor. The six (6) products included in the C₈-C₁₂ Mercaptan Group are listed below, along with their common synonyms and CAS numbers.

Product	Synonym	CAS No.
Normal Octyl Mercaptan	NOM, 1-Octanethiol	111-88-6
Tertiary Nonyl Mercaptan	TNM, Sulfole [®] 90 Mercaptan	25360-10-5
Normal Decyl Mercaptan	NDM, 1-Decanethiol	143-10-2
Normal Dodecyl Mercaptan	NDDM, 1-Dodecanethiol	112-55-0
Tertiary Dodecyl Mercaptan	TDM, Sulfole [®] 120 Mercaptan, Tertiary Dodecanethiol	25103-58-6
Sulfole [®] 100 Mercaptan	TNM and TDM Mixture	Mixture

Category Justification:

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:

The C₈-C₁₂ Mercaptan products are typically used as additives; agricultural, chemical and pharmaceutical intermediates; polymerization chain transfer agents; anti-oxidants; UV absorbers; and scavenger collector for metal sulfides. Products in this group are commercially available to industrial customers only, which typically include Plastic and Rubber Manufacturers, Lubricant Manufacturers, Mining, and Health and Pharmaceutical Companies.

Physical/Chemical Properties:

While the C₈-C₁₂ 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 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:

Overall, the C₈-C₁₂ Mercaptan products may cause low to moderate acute and subchronic/chronic toxicity effects in humans. Dermal contact with some of these products may cause skin sensitization (an allergic skin reaction), and varying degrees of irritation, ranging from slightly irritating to highly irritating and corrosive. Irritation can occur following single or repeated dermal exposures. These products may also cause defatting of skin. Acute effects on the eye may include mild to severe irritation, corrosive and permanent (irreversible) damage. 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) or may be fatal. Irritation of the mouth, throat, and stomach may also occur, if ingested. The kidney and liver were indicated as potential target organs in inhalation toxicity studies conducted in animals at high vapor concentrations. Some of the kidney toxicity effects (i.e., hydrocarbon nephropathy) observed are specific to animal species only and are considered not relevant to humans. In addition, repeated exposure to high vapor concentrations of these products is not likely to occur during their anticipated use. Data are currently 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 no evidence for their potential to cause reproductive, teratogenic or developmental toxicity effects.

Environmental Information:

The environmental hazard potential for the products in the C₈-C₁₂ Mercaptan group is high. They are highly toxic to aquatic life and demonstrate a general tendency to persist in the environment (i.e., they are not expected to be readily biodegradable). Their octanol-water partition coefficients (log K_{ow}) are suggestive of potential to accumulate in aquatic life. Significant care should be taken to avoid releases of these products to sewage, drainage systems, and water bodies. Spillage should be quickly collected in the event of an accidental release.

Exposure Potential:

The most likely routes of exposure to the C₈-C₁₂ Mercaptan products are skin and eye contact, and potentially via inhalation because these products have low vapor pressures.

Workplace Use: The potentially exposed populations include: (1) workers who manufacture 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 most likely routes of exposure to these products in an occupational setting are eye and dermal contact, and potentially inhalation exposure. However, the likelihood of exposure to workers is expected to be low because these products are generally manufactured in enclosed, controlled environments, and are typically transported in well sealed drums and isocontainers. Additionally, due to the low odor thresholds of these products (e.g., the odor threshold for n-dodecyl mercaptan is 0.5 parts per billion; ppb), leaks can be detected quickly, and prolonged exposures can be avoided. 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 will likely adhere to safe handling practices and wear appropriate personal protective equipment (PPE), and have access to exposure prevention measures (e.g., engineering controls). Customers are also likely to use appropriate PPE during handling, and to 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 not sold to the general population. The potential for odor complaints from the public is possible if a large scale spill or significant release occurred near a residential setting.

Potential Environmental Release: The potential for significant accidental releases of these products to the environment is possible during transportation of large quantities over long distances via truck trailers, railcars, or container ships; however, available data indicate that the frequency of distribution incidents involving significant releases of these products has been minimal. Chevron Phillips Chemical Company LP is committed to operating in an environmentally responsible manner and has adopted the American Chemical Council's Responsible Care® initiative.

Risk Management:

Chevron Phillips Chemical Company LP 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. We begin by ensuring that all of our customers, distributors, carriers, and users of these products are well informed about the properties of each product. To that end, a Material Safety Data Sheet and a certificate of analysis accompany each shipment from our manufacturing plant. In addition, a Hazard and Exposure Risk Characterization (HERC) has been completed for the C₈-C₁₂ Mercaptan products to evaluate the potential risks associated with their distribution and use. Material Safety Data Sheets are also available online, and major updates or revisions are sent to current customers automatically.

Regulatory Information:

Regulations exist that govern the manufacture, sale, transportation, use, and disposal of these C₈-C₁₂ Mercaptan products. These regulations may vary by city, state, country or geographic region. Additional relevant information may be found by consulting the applicable product Material Safety Data Sheets.

Sources of Additional Information:

Organization for Economic Co-Operation and Development (OCED) SIDS. 2010. DRAFT SIDS Initial Assessment Report for SIAM 31. C₈-C₁₂ Aliphatic Thiols.

Conclusion:

The C₈-C₁₂ Mercaptan products are classified as hazardous chemicals. Efforts must be taken to minimize eye, dermal and inhalation exposures to these products by adhering to safe handling procedures, designated applications and uses, appropriate personal protective equipment practices, and labeling, storage, and transportation procedures and requirements. The relevant product Material Safety Data Sheets 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/>

July 19, 2011