Product Stewardship Summary

SULFIDES, DISULFIDES, AND POLYSULFIDES SPECIALTY PRODUCTS

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 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 Sulfides, Disulfides, and Polysulfides Specialty Products are comprised of three classes of organosulfur compounds: sulfides, disulfides and polysulfides. There are currently 19 products in this group, and they are listed below based on their chemical class.

Sulfides
- Dimethyl sulfide
- Dimethyl sulfide, pure
- Diethyl sulfide
- Di-n-butyl sulfide
- Ethyl n-octyl sulfide
- Methyl ethyl sulfide
- N-dodecyl methyl sulfide
- Sulfur calibration standard

Disulfides
- Dimethyl disulfide
- Di-n-butyl disulfide
- Di-sec-butyl disulfide
- Di-tert-butyl disulfide
- Di-n-propyl disulfide
- Di-tert-dodecyl disulfide

Polysulfides
- Di-tert-butyl polysulfide (TBPS 344)
- Di-tert-butyl polysulfide (TBPS 454)
- Di-tert-dodecyl polysulfide (TDPS 320)
- Di-tert dodecyl polysulfide (TDPS 532)
- Di-tert-nonyl polysulfide (TNPS 537)

Category Justification

Overall, the products within each class of compounds have similar physical and chemical characteristics, and exhibit similar health and environmental hazards and environmental fates.

Product Uses

These products are generally used as agricultural intermediates, sulfiding agents, refinery catalysts, lubricant additives, calibration standards, gas odorants, and processing aids in mining applications. They are commercially available to industrial customers only, which typically include distributors, agricultural and chemical manufacturers.

Physical/Chemical Properties

The products in this group are combustible or flammable liquids; they 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 tightly sealed container, and stored in a cool and well ventilated place, away from ignitable sources such as heat, sparks, open flames or hot surfaces.

Health Information

These products may cause acute inhalation and oral toxicity, chronic oral toxicity (reversible effects), aspiration toxicity, eye, skin, and respiratory irritation, skin sensitization, and central nervous system (CNS) effects. Products dimethyl disulfide, di-n-butyl sulfide, and sulfur calibration standard may be acutely toxic via the inhalation exposure route. Due to their generally low odor thresholds, prolonged inhalation exposure is not expected to occur; however, note that continuous, long-term exposure to some products may increase olfactory thresholds (i.e., decrease sense of smell). If accidentally ingested, dimethyl disulfide, di-n-butyl sulfide and sulfur calibration standard may be acutely harmful. In addition, if ingested, some of these products may cause an aspiration hazard, which may result in severe pulmonary damage (e.g., pneumonitis or inflammation) or may be fatal. Anemia (reductions in red blood cell parameters) was indicated in animal studies following repeated oral exposures to TBPS 454; however, this effect was reversible. Eye and skin contact with these products may cause mild to severe irritation. The potential for skin sensitization (an allergic skin reaction) may be possible with dermal contact with TBPS 344 and TBPS 454. Prolonged exposure to high vapor concentrations may cause respiratory irritation, CNS effects, including dizziness, headache, nausea, and loss of coordination. Toxicity data is currently unavailable to characterize their potential to cause cancer in humans. Genetic toxicity data are negative for the products that have been studied to date. Currently available data indicate these products are not expected to cause reproductive, teratogenic or developmental toxicity health effects.

Environmental Information

The environmental hazard potential for these products is varied, ranging from low to high. Some of these products may cause acute and chronic toxicity to aquatic life, with effects ranging from harmful to highly toxic. Specifically, dimethyl disulfide, ethyl n-octyl sulfide, TBPS 454 and TBPS 344 are expected to be highly toxic to aquatic life with long lasting effects, and TDPS 532, TNPS 537 and methyl ethyl sulfide are expected to be harmful to aquatic life also with long-term effects. Dimethyl sulfide is expected to be acutely harmful to aquatic life. Overall, the available data suggest that the polysulfides products are not readily biodegradable (will persist in the environment) and their bioaccumulation potential is expected to be high. The sulfide and disulfide products are expected to readily or inherently biodegrade and have a low potential to bioaccumulate. Due to the potential for some of these products to cause significant harm to aquatic environments, care should be taken to avoid releases of them to sewage, drainage systems and water bodies. Spillage should be quickly collected and properly disposed of to minimize harm to the environment.

Exposure Potential

The most likely routes of exposure to the Sulfides, Disulfides, and Polysulfides Specialty Products are skin and eye contact, and inhalation exposures.

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 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. Due to their low odor thresholds, 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, rail cars or container ships; however, available data indicate that the frequency of distribution incidents involving significant releases of these products has been minimal. Chevron Philips 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, Hazard and Exposure Risk Characterizations (HERCs) have been completed for the Sulfides, Disulfides, and Polysulfides Specialty Products to evaluate the potential risks associated with their distribution and use.

Regulatory Information

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

Sources of Additional Information

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Conclusion

The Sulfides, Disulfides, and Polysulfides Specialty Products are classified as hazardous chemicals. Efforts should 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 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

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September 7, 2012