Propylene glycol methyl ether (PGME) and Propylene glycol methyl ether acetate (PGMEA) [MethylPROXITOL and MethylPROXITOL acetate] Product Stewardship Summary

(CAS number 107-98-2 PGME and CAS number 108-65-6 PGMEA)

Chemical Formula for PGEE and PGEEA

PGME- $C_4H_{10}O_2$
PGMEA- $C_6H_{12}O_3$

What is PGME and PGMEA?

PGME and PGMEA are both glycol ethers based on propylene oxide and methanol. They are solvents having a bi-functional nature (ether-alcohol and the respective acetate). They are both clear liquids, with PGMEA having a pleasant, fruity odour.

The Shell Chemicals range of propylene oxide-based glycol ethers are sold under the trade name PROXITOL.

How is PGME and PGMEA Used?

They are used as intermediates and in formulations in industrial, professional or consumer applications, mainly in surface coatings, printing inks, cleaners, agrochemical or de-icing/anti-icing formulations. They are also used as extractants, as coalescing agents and as flow improvers in water-based paints.

Health, Safety and Environmental Considerations

PGME and PGMEA are flammable liquids with flashpoints of respectively 86°F/30°C and 113°F/45°C. PGME and PGMEA are an isomer mix, of which typically 99.8% are 1-Methoxypropanol-2 (or respective acetate) and typically <0.1% are 2-Methoxypropanol-1 (or respective acetate), a component which in its pure form has some serious health effects. These negative health effects have not been shown for PGME and PGMEA.

If large quantities are ingested or high vapour concentrations inhaled, PGME may cause central nervous system depression including headaches, nausea, dizziness, drowsiness, and coma; the effect of PGMEA is less severe. To a certain extent, both substances can cause slight irritations of eyes, skin and respiratory tract, but these effects do not trigger classification according to the Globally Harmonized System (GHS) or Classification, Labeling and Packaging (CLP) criteria. Shell PROXITOLs are not classified as carcinogens or mutagens, are not expected to cause cancer in humans, nor do they impair fertility or damage the developing fetus.
The occupational exposure limits set by various regulatory authorities applicable to PGME are 0 - 100 ppm and 50 ppm for PGMEA.

PGME and PGMEA are of low toxicity towards aquatic organisms. They are completely miscible with water, biodegradable and not expected to bio-accumulate. In air, they rapidly oxidise by a photochemical reaction.

Storing and Transporting PGME and PGMEA

These glycol ethers are transported by tank truck, rail car and vessel, primarily in bulk quantities, but also as packed products. Due to their flammability, they are classified as hazardous for transport under transport regulations.

Glycol ethers should be stored at ambient temperatures away from sources of ignition and substances with oxidising or corrosive properties. PROXITOLS are stabilised with a certain amount of inhibitor to prevent the formation of peroxides.

Risk Characterization Summary

Risks associated with exposure to these products have been evaluated for the following “chain-of-commerce” activities: manufacture, storage, product transfer, transportation, and customers/markets. They are manufactured, stored and transported to customers in closed systems. Depending on the customer, end uses may vary from use as an intermediate for the manufacture other chemicals, commercial products or certain formulated consumer products. Proper equipment design and handling procedures maintain low risk from exposure where used as an intermediate. Exposures may be higher in commercial and consumer applications. To minimize risk, additional controls, such as special handling procedures and protective packaging, are implemented.

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 health and safety information. Additional information is available through the chemical’s applicable Safety Data Sheet, which should be consulted before use of the chemical. This product stewardship summary does not supplant or replace required regulatory and/or legal communication documents.

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