Mono Ethylene Glycol (EG, MEG) Product Stewardship Summary

(CAS number 107-21-1)

Chemical Formula for Mono Ethylene Glycol

HOCH2CH2OH

What is Mono Ethylene Glycol?

Mono Ethylene Glycol is the first of the three members of a homologous series of dihydroxyalcohols. MEG is produced in the Master Process by the direct hydration of ethylene oxide. Smaller amounts of diethylene glycol (DEG) and triethylene glycol (TEG) are co-produced in this process. In Shell, the MEG can also be produced by a catalytic conversion of Ethylene Oxide. This process is called OMEGA (Only MEG Advantage) and achieves a conversion efficiency of over 99% compared to around 90% for conventional processes.

How is MEG Used?

MEG is by far the largest volume glycol product and is used in a variety of applications. MEG is typically commercially available in three grades: fibre, industrial and antifreeze. The markets for EG products are polyester fibres, polyethylene terephthalate (PET) plastics, coolants in automobile antifreeze, and resins. The excellent humectant (hygroscopicity) properties of EG products also make them ideal for use in fibres treatment, paper, adhesives, printing inks, leather and cellophane.

Shell Chemicals does not sell to customers that use MEG in theatrical fogs or other artificial smoke generator applications; in the manufacture or preparation of foods or pharmaceuticals where glycol is not further reacted to produce a derivative product; or in aircraft de-icing applications.

Health, Safety and Environmental Considerations

Under normal conditions of use, ethylene glycols are not expected to cause irritation to the skin, eyes or respiratory tract. However, in applications where vapours or mists are created, inhaling may cause a mild burning sensation in the nose, throat and lungs.

MEG is classified as harmful if swallowed. The estimated fatal dose for man is 100 ml. It may cause damage to the kidney through prolonged or repeated exposure.

Repeated high dose oral exposure in laboratory animals has resulted in birth defects; however, these effects are not believed to be relevant to humans under normal conditions of use.

The American Conference of Governmental Hygienists (ACGIH) has set a ceiling on worker exposure to ethylene glycol vapours or mists of 39.4 ppm. Specific countries may have more stringent requirements than ACGIH. If there is a potential for exposure above these limits, proper protective clothing and appropriate respiratory protection is required.

Mono Ethylene Glycols are biodegradable, have a low potential to bioaccumulate and have low toxicity to aquatic organisms.

MEG is not flammable, unless preheated.

Storing and Transporting Ethylene Glycol

Mono Ethylene Glycols are transported by tank truck, rail car and vessel. For smaller shipments, Shell Chemical companies or their distributors, package these products in iso-containers or drums. Most ethylene glycol shipments are directly from the point of manufacture to the customer, although depots and distributors are used in some countries.

Risk Characterization Summary

Risks associated with exposure to this product have been evaluated for the following "chain-of-commerce" activities: manufacture, storage, product transfer, transportation, and customers/markets. It is 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.