Sorbitol Propoxylated Polyols

Product Overview

Sorbitol propoxylated polyols are clear liquids that are colorless to yellow. They have a slightly sweet odor. These materials belong to a category of materials called polyether polyols and are produced by reacting sorbitol (a sugar) with propylene oxide. Dow markets a variety of these polyols of different molecular weights and properties under the trade names VORANOL™ polyether polyols and TERCAROL™ polyether polyols. See Product Description.

- Sorbitol propoxylated polyols are used as chemical building blocks in the manufacture of rigid polyurethane foams. See Product Uses.
- Sorbitol propoxylated polyols are not considered hazardous chemicals. They are stable under recommended storage conditions. However, they can oxidize at elevated temperatures. Avoid contact with oxidizing materials and strong acids. Avoid unintended contact with isocyanates. Because of their low vapor pressure, these products are not likely to be inhaled. See Health Information or Physical Hazard Information.
- Sorbitol propoxylated polyols are inherently biodegradable, unlikely to accumulate in the food chain (bioconcentration potential is low) and are practically nontoxic to aquatic organisms on an acute basis. See Environmental Information.

Names

- CAS No. 52625-13-5
- D-Glucitol, propoxylated
- Poly[oxy(methyl-1,2-ethanediyl)]
- Propylene oxide-sorbitol polymer
- Sorbitol polyoxypropylene ether
- Sorbitol propoxylated polyol
- Various VORANOL™ and TERCAROL™ polyether polyols, including, for example:
  - VORANOL RN 482
  - TERCAROL RF 55
  - TERCAROL RM 601
  - TERCAROL 8092
Product Safety Assessment: Sorbitol Propoxylated Polyols

- Exposure to sorbitol propoxylated polyols could occur at a production facility for these polyols or at facilities that use these materials to manufacture other products. These polyols are manufactured for industrial use, making direct consumer exposure unlikely.\(^2\) See Exposure Potential.

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Manufacture of Product\(^3\)
- **Process** - Sorbitol is reacted with propylene oxide as shown in the reaction below. Sorbitol serves as the initiator in this reaction.

![Chemical Reaction]

Sorbitol
(Designated as \(R\) in the reaction product)

Propylene oxide

Sorbitol propoxylated polyether polyol

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Product Description\(^1\)
Sorbitol propoxylated polyether polyols are clear liquids that are colorless to yellow in color. They have a slightly sweet odor and are hygroscopic (attract water from the atmosphere and environment). Dow markets these products under the trade names VORANOL* polyether polyols and TERCAROL* polyether polyols.

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Product Uses\(^4,5\)
Sorbitol propoxylated polyether polyols are mainly used to produce polyurethane materials by reaction with isocyanates. Primary uses include production of:

- Rigid polyurethanes for thermal insulation for appliances and in construction applications
- Flexible slabstock and molded polyurethane foam
- Coatings, adhesives, sealants, and elastomers for a variety of applications

Other minor uses for sorbitol propoxylated polyether polyols are as reactants in transesterification, silane capping, and the production of surfactants, rheology modifiers and lubricants.

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Exposure Potential
Sorbitol propoxylated polyols are manufactured for industrial use only. Based on the uses for these materials, the public could be exposed through:

- **Workplace exposure** – Exposure can occur either in a production facility for these polyols or in the various industrial or manufacturing facilities that use these polyols or products that contain them. Those working with polyols in manufacturing operations could be exposed during maintenance, sampling, testing or other procedures. Each manufacturing facility should have a thorough training program for employees, and appropriate work processes and safety equipment in place to limit unnecessary exposure. See Health Information.

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Revised: February 6, 2015

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Consumer exposure to products containing sorbitol propoxylated polyols – Because these polyols are used as chemical building blocks for the manufacture of other products, direct consumer exposure is unlikely. There would be no unreacted polyol in the polyurethane products produced. See Health Information.

Environmental releases – If released to the environment, sorbitol propoxylated polyols will partition to water, due to their high water solubility and low volatility. Since they are inherently biodegradable, they will likely be removed in biological wastewater treatment facilities as well as other water and soil environments. In the event of a spill, the focus is on containing the spill to prevent contamination of soil, surface or ground water. At ambient temperatures, polyols are practically nonvolatile, making evaporation to the atmosphere unlikely. Spills of polyol on tile, concrete or metal surfaces can cause slipping hazards. For small spills, polyols should be absorbed with materials such as sand or sawdust, then swept up for disposal according to governmental requirements. See Environmental, Health, and Physical Hazard Information.

Large release – Industrial spills or releases are infrequent and are generally contained. If a large spill does occur, the material should be contained by creating ditches or dikes. The polyol can then be pumped into containers, such as drums or tank trucks for disposal. The remaining spill may be absorbed with absorbent materials such as sand or saw dust, cleaned up and disposed of according to governmental requirements. Personnel engaged in clean up of spills should observe proper skin and eye protection practices. Fires involving polyols can be readily extinguished with water fog, carbon dioxide, foam, or dry chemical extinguishers. Because incomplete combustion may lead to the build-up of toxic by-products, firefighters should wear positive-pressure, self-contained breathing apparatus (SCBA). Emergency procedures should be followed carefully. See Environmental, Health, and Physical Hazard Information.

For more information, see the relevant Safety Data Sheet.

Health Information
Health information for sorbitol propoxylated polyether polyols is summarized on the relevant Safety Data Sheet. The Safety Data Sheet is the preferred source for specific health information. An overview of health information for sorbitol propoxylated polyether polyols appears below.

Eye contact – Sorbitol propoxylated polyols are essentially non-irritating to the eyes.

Skin contact – Brief contact is essentially nonirritating to skin. Prolonged skin contact is unlikely to result in absorption of harmful amounts. It did not cause allergic skin reactions when tested in laboratory animals.

Inhalation – At room temperature, exposure to vapor is minimal due to low volatility.

Ingestion – These products have low toxicity if swallowed. Swallowing small amounts incidentally as a result of normal handling operations is not likely to cause injury.

For more information, see the relevant Safety Data Sheet.

Environmental Information
Sorbitol propoxylated polyols are water soluble and nonvolatile. If released to the environment, they will have a tendency to remain in water with minimal tendency to bind to soil or sediment.

Sorbitol propoxylated polyols polyols are unlikely to persist in the environment. They are inherently biodegradable, which suggests that they will likely be removed in biological wastewater treatment facilities as well as in other water and soil environments.

Sorbitol propoxylated polyols polyols are not likely to accumulate in the food chain (bioconcentration potential is low), due to their high water solubility and high molecular weight. Propoxylated/ethoxylated ethylenediamine polyols are practically non-toxic to fish and other aquatic organisms on an acute basis (LC50/EC50 > 100 mg/L in the most sensitive species tested).

For more information, see the relevant Safety Data Sheet.

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Physical Hazard Information

Sorbitol propoxylated polyols are stable under recommended storage conditions. Avoid contact with oxidizing materials (such as peroxides or hypochlorite salts) and strong acids. Avoid unintended contact with isocyanates. The reaction of polyols and isocyanates generates heat.

Fires involving polyols can be readily extinguished with water fog, carbon dioxide, foam, or dry chemical extinguishers. If a fire occurs, evacuate personnel and deny unnecessary entry. Burning liquids may be moved by flushing with water to protect personnel and minimize property damage. Do not use a direct water stream as it may spread the fire. Because incomplete combustion may lead to the build-up of toxic by-products, firefighters should wear positive-pressure, self-contained breathing apparatus.

For more information, see the relevant Safety Data Sheet.
NOTICES

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Form No. 233-00302-MM-0215X