PRODUCT TECHNICAL BULLETIN

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2-Ethyl-1,3-Hexanediol (EHDiol)

CAS Registry Number 94-96-2

Typical Properties

Property	Value
Molecular Weight	146
Water, %	0.05 Max.
Specific Gravity @ 25 °C, g/cc	0.942 at 68°F (20°C)
Pt-Co Color	15 Max.
Appearance/Odor	Nearly Colorless, Viscous Liquid with No Odor.
Acidity as acetic acid, %	0.02 Max.
EHDiol, %	>99
Boiling Point	469°F (243°C)
Freezing Point	Sets to Glass at -40°F (-40°C)
Volatility/Vol (%)	100 at 212°F (100°C)
Vapor Pressure (mm Hg)	<1 at 167°F (75°C)
Vapor Density (Air = 1)	5
Solubility in H_2O	4.2 wt% at 68°F (20°C)
H_2O Solubility in EHDiol	12 wt% at 68°F (20°C)
pH	6.1 at 4% in H_2O
Evap. Rate (Butyl Acetate = 1)	<1
Flash Point PMCC, ASTM D93	276°F (136°C)

About

2-Ethyl-1,3-Hexanediol is a colorless, nearly odorless, high-boiling liquid that is relatively insoluble in water, mineral oils, and paraffin oils. It has good compatibility with aliphatic hydrocarbons and can be used to stabilize hydrophilic-hydrophobic systems.

Uses

EHDiol is used in two-package urethanes as a reactive diol and viscosity reducer. At room temperature, EHDiol acts as a conventional solvent. However, when a two-package urethane is cured at elevated temperatures, EHDiol reacts into the urethane matrix instead of volatilizing out of the coating. This minimizes or even eliminates solvent emissions from the system.

Cosmetics

EHDiol resembles glycerol in its lubricity and emollient actions on the skin and serves as a valuable component of cosmetic creams and lotions. It is an efficient blending and coupling agent for otherwise immiscible oil-water systems, such as hair dressings, shampoos and liquid cleansing creams.

Other Applications

EHDiol has found utility in the textiles industry as a nylon lubricant for spinning. EHDiol is also an effective insect repellent. It is used as a vehicle and solvent in printing inks and also as raw material for various alkyd resins and plasticizers. When used as a substitute for alcohols, its low vapor pressure reduces the amount of volatile organic compounds in finished formulations.

Storage and Handling

EHDiol is not corrosive to common materials of construction. However, since the use requirements usually require freedom from iron contamination plus low odor and color, this product is not commonly stored in plain steel equipment. It is shipped in phenolic-lined steel drums and is often stored in phenolic-lined steel storage tanks.

Storage at room temperature is suggested. Low temperatures cause the product to become highly viscous and elevated temperatures make it more difficult to maintain color and odor specifications. For best stability, storage under an atmosphere of nitrogen is preferred. When properly stored, EHDiol has a shelf life of 2 years. A stainless steel centrifugal pump is normally used for transfer service, but a rotary or gear pump should be considered if cold, viscous product must be pumped. Polyethylene, aluminum, stainless steel, or lined steel piping can be used.

Toxicological Properties

The oral toxicity of EHDiol is moderate with a single acute LD_{50} dose for rats of 1,400 mg per kilogram body weight. EHDiol does not penetrate the skin in harmful amounts, as evidenced by the single skin absorption LD_{50} dose for rabbits of 10.7 to 15.2 milliliters per kilogram body weight. It is not active as a skin irritant or skin sensitizer. When skin patch tests were done on 200 human subjects, it was found that only one percent became sensitized. This is less sensitization than that found when common materials, such as cocoa butter, are similarly tested. EHDiol is irritating to the eyes and produces injury on contact, which is comparable to that caused by many liquid hand soaps. The material has been shown to cause birth defects in laboratory animals at high dosage levels.

Availability and Packaging

EHDiol is commercially available in drums and bulk from Dixie's plant in Pasadena, Texas.