

SIDS INITIAL ASSESSMENT PROFILE

CAS No.	112-50-5
Chemical Name	Ethanol, 2-[2-(2-ethoxyethoxy)ethoxy]
Structural Formula	HO-CH ₂ CH ₂ OCH ₂ CH ₂ OCH ₂ CH ₂ -OCH ₂ CH ₃

SUMMARY CONCLUSIONS OF THE SIAR**Analog Justification**

Data for ethanol, 2-[2-(2-ethoxyethoxy)ethoxy] or triethylene glycol ethyl ether (TGEE) for some endpoints are either missing or limited. Therefore, triethylene glycol methyl ether (TGME) is used for the genetic, reproductive, neurotoxicity, and algal toxicity endpoints. Use of TGME is justified based on similar structures (i.e., the two chemicals differ by only one methylene group in the terminal alkyl moiety), as well as similarities in physicochemical and environmental fate properties and toxicity. Further, the diffusion rates through human skin are quite comparable. Finally, based on data for monoethylene glycol ethers, TGME is expected to be more toxic than TGEE, so conclusions using TGME will be more conservative.

Human Health

TGEE is of low acute toxicity in experimental animals by the oral, dermal and inhalation routes of exposure. The oral LD₅₀ values are 8,500 and 10,600 mg/kg in male rats and all rats, respectively. In an inhalation study, a 1-hour exposure to 200 mg/L resulted in no deaths. The dermal LD₅₀ from one study is 8,200 mg/kg. TGEE has been shown to be irritating to skin and mildly irritating to eyes of rabbits.

In a 30-day drinking water study in rats, a NOAEL of 750 mg/kg/day was identified. Changes observed at 3,300 mg/kg/day in this study were decreased weight gain, slightly increased blood urea concentrations, and "congestion and cloudy swelling of the liver (6/10) and kidney (1/10)." All animals died at 13,290 mg/kg/day. TGEE produced slight erythema and edema in rats exposed dermally at 1000 mg/kg/day for 21 days. One of five males exhibited testicular effects, which was concluded to be unrelated to treatment.

TGEE did not exhibit developmental toxicity in rats treated with up to 1,000 mg/kg/day (highest dose tested).

TGEE has not been tested for its genetic toxicity either in vivo or in vitro. Based on the lack of genotoxicity of TGME (a compound of similar structure), TGEE is not expected to be genotoxic.

Environment

TGEE is miscible (25 °C) in water and its specific gravity is 1.03 g/cm³ at 20 °C. The vapor pressure is 89.2 hPa at 20 °C. The melting point is -19°C and the boiling point is 256 °C. Due to a low calculated log K_{ow} (-0.96), TGEE is not expected to undergo bioaccumulation in aquatic organisms.

Upon release to the atmosphere, TGEE is estimated to undergo photodegradation (atmospheric half life = 2.8 hrs). TGEE is readily biodegradable (71% after 20 days) under aerobic conditions tested in fresh water. In Level III Fugacity modeling, mass balances of < 0.001% in air, 45.3% in water, 54.6% in soil and 0.0755% in sediment were estimated and indicate a low probability of volatilization and a preference for partitioning to water and soil.

TGEE is of low acute aquatic toxicity as tested in a variety of freshwater and saltwater species. In *Pimephales*

promelas, the 96-hr LC50 is > 10,000 mg/L. In *Daphnia magna*, the 48-hr LC50 is 10,000 mg/L. In algae, the modeled LC50 (using EPIWIN) is also > 10,000 mg/L. Finally, TGEE will not adversely affect sewage treatment microorganisms (IC50 > 10,000 mg/L).

Exposure

TGEE was produced at an estimated 4,072 – 4,538 tonnes in 1990 in the U.S. TGEE is typically prepared by the reaction of ethanol and ethylene oxide in the presence of a catalyst. Approximately ninety-five percent of TGEE is used as a major raw material (diluent) in the formulation of hydraulic brake fluid.

Human exposure to TGEE may occur during manufacturing and through the use of this material in hydraulic brake fluids. Due to its low vapor pressure, inhalation exposures will be insignificant whereas dermal exposures may be higher.

RECOMMENDATION AND RATIONALE FOR THE RECOMMENDATION

This chemical is currently of low priority for further work.

Human Health: Triethylene glycol ethyl ether possesses properties indicating a hazard for human health (dermal irritation and mild eye irritation). These hazards do not warrant further work as they are related to reversible, transient effects. They should nevertheless be noted by chemical safety professionals and users.

Environment: Triethylene glycol ethyl ether is currently of low priority for further work due to its low hazard profile.