

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

INTEROFFICE COMMUNICATION

August 28, 2000

TO: File for triethylene glycol monoethyl ether (CAS No. 112-50-5)

FROM: Marco Bianchi, Toxics Unit, Air Quality Division

SUBJECT: Initial Threshold Screening Level

The initial threshold screening level (ITSL) for triethylene glycol monoethyl ether (TGME) is 100 microgram per cubic meter ($\mu\text{g}/\text{m}^3$) based on an annual averaging time.

The following references or databases were searched to identify data to determine the ITSL: Integrated Risk Information System on-line, Health Effects Assessment Summary Table, National Toxicology Program Management Status Report on-line, Registry of Toxics Effects of Chemical Substances, Environmental Protection Bureau (EPB)-Chemical Criteria Database, EPB library, Chemical Abstract Service-online, National Library of Medicine-online, International Agency for Research on Cancer on-line, National Institute for Occupational Safety and Health Pocket Guide, and American Conference of Governmental Industrial Hygienists Guide.

A complete reference check was conducted for triethylene glycol monoethyl ether but only limited information was available to derive an ITSL. A series of acute toxicity studies obtained through the Environmental Protection Agency (EPA) Toxic Substance Control Act (TSCA) Library, showed that MB Research Laboratories, Inc. conducted Lethal Dose 50% (LD_{50}) and Lethal Concentration (LC_{50}) tests on TGME on behalf of Olin Research Center. In the LD_{50} study, groups of ten male albino Wistar rats were fasted for 18 hours, then given a single dose of TGME in four dose groups by gastric intubation. The animals were observed for 14 days for signs of toxicity and then necropsied. The LD_{50} value was estimated by the method of Horn (1956), and determined to be 8.5 grams per kilogram (g/kg).

Likewise, for the LC_{50} study, ten male albino Wistar rats were placed in a chamber and exposed to a nominal concentration of 200 mg/liter of the test material for a period of one hour. The rats were removed from the chamber at the end of the exposure, returned to their cages and observed daily for 14 days for signs of toxicity, then necropsied. The TGME inhalation exposure resulted in no deaths and no dose-related effects either clinically or histologically. Although an LC_{50} was not determined for this compound, the exposure concentration of 200 mg/liter ($200,000 \text{ mg}/\text{m}^3$) is appropriate to use as a surrogate LC_{50} value to determine an ITSL. The Air Quality Division has used this procedure in prior evaluations on other chemicals for which no LC_{50} value was determined, but where the highest exposure concentration was used to derive an ITSL.

According to the Michigan Air Toxics Rules (R 336.1232 – Methodology for determining ITSL), a one-hour LC₅₀ value takes precedence over an LD₅₀ value when determining an ITSL. Therefore, the LC₅₀ of 200 mg/liter will be used to derive an ITSL.

The ITSL was derived as follows:

$$LC_{50} = 200 \text{ mg/liter}$$

$$200 \text{ mg/liter} \times 1000 \text{ milliliters/m}^3 = 200,000 \text{ mg/m}^3$$

$$ITSL = \frac{200,000 \text{ mg/m}^3}{500 \times 40 \times 100} = 0.10 \text{ mg/m}^3$$

$$0.10 \text{ mg/m}^3 \times 1000 = 100 \text{ } \mu\text{g/m}^3 \text{ based on annual averaging.}$$

The ITSL for triethylene glycol monoethyl ether = 100 $\mu\text{g/m}^3$ based on annual averaging.

References:

1. EPA TSCA 8(e) submittal. 1977. Inhalation toxicity in rats. Project #MB 77-1818 for Olin. MB Research Laboratories, Inc. EPA/OTS Doc. 878216032; TSCATS/031549.
2. EPA TSCA 8(e) submittal. 1977. Report on oral LD₅₀ in rats. Project #MB 77-1818 for Olin. MB Research Laboratories, Inc. EPA/OTS Doc. 878216032; TSCATS/031549.
3. Horn, HJ. 1956. Biometrics. 12:311.

MB:SLB

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