

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

INTEROFFICE COMMUNICATION

October 13, 2003

TO: Ethyl vinyl ether file (CAS # 109-92-2)
FROM: Gary Butterfield
SUBJECT: Screening level for ethyl vinyl ether

Ethyl vinyl ether is also known as vinyl ethyl ether and ethoxyethene. Ethyl vinyl ether has a molecular weight of 72.1 g/mol. Ethyl vinyl ether is a colorless liquid at ambient temperatures. The melting point is -115 degrees Celsius. The boiling point is 36 degrees Celsius.

The following references or databases were searched to identify data to determine the screening level: U.S. Environmental Protection Agency (EPA) Integrated Risk Information System (IRIS), National Institute for Occupational Safety and Health (NIOSH) Registry for Toxic Effects of Chemical Substances (RTECS), American Conference of Governmental and Industrial Hygienists (ACGIH) Threshold Limit Values (TLVs), Michigan Department of Environmental Quality (DEQ) library, International Agency for Research on Cancer (IARC) Monographs, Chemical Abstract Service (CAS) Online (1968 - May 2003), National Library of Medicine (NLM) - Toxline, and National Toxicology Program (NTP) Status Report.

The CAS and NLM on-line literature searches were conducted on May 5, 2003. Two published acute studies were located during the literature searches. Smyth et al (1969) has reported a LD50 of 8160 uL/kg (or 6150 mg/kg based on a density of 0.754 g/ml) from a rat oral study. Carpenter & Smyth (1949) reported a four hour LC50 of 16000 ppm (or 47200 mg/m3) in rats.

The best study upon which to base the screening level is the more recent of these two acute studies, the 1969 study reported by Smyth et al. In older studies, chemical purity, analytical methods, toxicological techniques used, and other considerations can put the older 1949 study in some question, even though it is an inhalation study compared to the oral exposures from the LD50 study. The use of the LD50 also results in a lower ITSL than if the LC50 is used. A lower ITSL may well be more protective of public health, because the amount of possible exposure will be reduced.

The screening level can be calculated by using the LD50 and the equation from R232(1)(h) as follows.

$$\text{ITSL} = \frac{6150 \text{ mg/kg}}{500 \times 40 \times 100 \times .167} \times \frac{1 \text{ kg}}{0.9 \text{ m}^3} = 20 \text{ ug/m}^3 \text{ annual average}$$

The default rat inhalation value of 0.9 m3/kg was used in the above calculation.

References:

Carpenter & Smyth. 1949. The assay of acute vapor toxicity, and the grading and interpretation of results on 96 chemical compounds. *Journal of Industrial Hygiene and Toxicology* 31:343-6.

Smyth et al. 1969. Range - finding toxicity data: list vii. *American Industrial Hygiene Assoc. Journal* 30:470-6.