

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

INTEROFFICE COMMUNICATION

TO: 2-Ethylbutanol file (CAS # 97-95-0)

FROM: Gary Butterfield

SUBJECT: Screening level for 2-Ethylbutanol

DATE: July 9, 2008

2-Ethylbutanol is also known as 2-ethyl-1-butanol. It is a liquid with a melting point of -15C, and a boiling point of 147C. The vapor pressure is 1.5 mmHg at 25C. The molecular weight is 102.2 g/mol. The molecular formula is C₆H₁₄O.

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 2008), 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 20, 2008. There were a couple of acute oral LD50 studies and one acute inhalation study with 2-ethylbutanol exposure. One of the acute oral and the acute inhalation (Eli Lilly and Company) studies were unpublished and submitted to EPA under the ToSCA provisions. A copy of the unpublished inhalation study was requested from EPA but took several weeks to arrive. In order to set a screening level in the shortest possible time so the permit could be issued on time, an ITSL was initially determined by use of the published rat oral LD50 of 1850 mg/kg reported by Smyth et al (1954). That screening level was calculated to be 6 ug/m³ by using R232(1)(h).

A copy of the unpublished acute rat inhalation study (Eli Lilly and Company (1983)) was finally obtained from EPA. In this study, groups of 10 male and 10 female F344 rats were nose only exposed for 4 hours to an aerosol of 2-ethylbutanol at a concentration of 2.05 mg/L with a size MMAD 10 um and 2.3 geometric standard deviation. There were no deaths observed over the 14 day observation period, so the actual LC50 would be greater than 2.05 mg/L. The actual LC50 value for 2-ethylbutanol is not known but for the purpose of calculating an ITSL, the value of 2.05 mg/L will be used as a pseudo-LC50.

This acute inhalation study provides the more proper ITSL, based on the hierarchy of available data that can be used for ITSL calculation in R232. The ITSL will be calculated using R232(1)(f) and the LC50 as follows.

$$\text{ITSL} = \frac{2.05 \text{ mg/L}}{500 \times 100} = 40 \text{ ug/m}^3 \text{ with an annual average}$$

References:

Eli Lilly and Company. 1983. Acute rat inhalation study with 2-ethyl-1-butanol. OTS 0544644.

Smyth et al. 1954. Range-finding toxicity data List V. AMA Archives of Industrial Hygiene and Occupational Medicine 10:61-68.

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