

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

INTEROFFICE COMMUNICATION

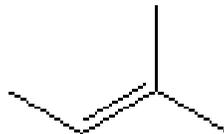
October 1, 2001

TO: File for Amylene (CAS No. 513-35-9)
FROM: Michael Depa, Toxics Unit, Air Quality Division
SUBJECT: Development of the Screening Level

The initial threshold screening level (ITSL) for amylene (also called 2-methyl-2-butene) is 106 $\mu\text{g}/\text{m}^3$ (annual averaging time).

The following references or databases were searched to identify data to determine the screening level: Environmental Protection Agency's (EPA's) Integrated Risk Information System (IRIS), the Registry of Toxic Effects of Chemical Substances (RTECS), the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLV), National Institute of Occupational Safety and Health (NIOSH) Pocket Guide to Hazardous Chemicals, Environmental Protection Bureau Library, International Agency for Research on Cancer (IARC) Monographs, Chemical Abstract Service (CAS) Online (1967- July 2001), National Library of Medicine (NLM), Health Effects Assessment Summary Tables (HEAST), and National Toxicology Program (NTP) Status Report. The EPA has not established a reference concentration (RfC) or reference dose (RfD) for amylene. The ACGIH and NIOSH have not established Occupational Exposure Limits (OELs). The molecular weight is 70.134 g, and the molecular formula is C_5H_{10} . The molecular structure is pictured in Figure 1. The melting point is -134°C . Amylene is not water soluble. The boiling point is 39°C , and its physical state is a flammable liquid (flash point -45°C). The vapor pressure is 468 mm Hg @ 25°C .

Figure 1. Molecular Structure of Amylene



In a 4-hour LC50 study, one group of five male and five female Fischer 344 rats was exposed to a concentration of 5300 mg/m^3 for 4 hours followed by a 14 day observation period (Dow, 2001). Weight gain was considered normal for both sexes during the observation period. Clinical signs included red staining around the nose and eye, porphyrin soiling, and swollen area around the eye. All animals survived the 14 day observation period. The LC50 was determined to be greater than 5300 mg/m^3 .

In another acute toxicity study, an unknown number of white rats (strain not specified) were exposed to 6.6% (66,000 ppm or 189,000 mg/m^3) amylene for roughly 2 hours (Riggs, 1925). The author reported that respiratory failure resulted. No other details were reported.

Derivation of Screening Level

The LC50 study by Dow (2001) was determined to be the best study with which to develop a screening level. Based on Rule 232(1)(f) the ITSL was calculated as follows:

$$\text{ITSL} = \text{LC50}/(500 \times 100)$$

$$\text{ITSL} = (5300 \text{ mg}/\text{m}^3)/50000$$

$$\text{ITSL} = 0.106 \text{ mg}/\text{m}^3$$

$$\text{ITSL} = 106 \text{ }\mu\text{g}/\text{m}^3$$

The ITSL for amylene is 106 $\mu\text{g}/\text{m}^3$ (annual averaging time)

References

Dow. 2001. An acute whole-body inhalation toxicity study of 2-methyl-2-butene in Fischer 344 rats. Dow Corning Corporation, Health and Environmental Sciences, Technical Report Number 2001-i0000-50338. Study Number 9589. Study Director Joseph M Tobin.

Riggs LK. 1925. The physiologic properties of some unsaturated hydrocarbons. Proceedings of the Society for Experimental Biology and Medicine. Volume 22. pages 269-270.

MD:DB

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