

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

INTEROFFICE COMMUNICATION

TO: p-Cymene file (CAS # 99-87-6)  
FROM: Gary Butterfield  
SUBJECT: Screening level for p-Cymene  
DATE: January 6, 2009

p-Cymene is also known as p-isopropyltoluene. It is a liquid with a melting point of -68C, and a boiling point of 177C. The vapor pressure is 1.5 mmHg at 25C. The molecular weight is 134.2 g/mol. The molecular formula is C<sub>10</sub>H<sub>14</sub>.

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 - Nov 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 November 6, 2008. There were a couple of acute oral LD50 studies and one inhalation study with 4 weeks of exposure and an 8-week recovery period.

In one of the acute oral studies, reported by Jenner et al (1964), groups of 10 male and 10 female Osborne-Mendel rats were used to obtain the LD50 of 4750 mg/kg with 95% confidence limit of 3720 to 6060, as determined by the method of Litchfield and Wilcoxon (1949).

In the other acute oral rat study, reported by Smyth et al (1951), the LD50 was reported to be 2910 mg/kg with a 95% confidence limit of 2550 to 3320, as determined by the method of Thompson.

In the 4-week inhalation study, groups of male Long-Evans rats were exposed to concentrations of 0, 50 or 250 ppm for 6 hours per day, 5 days per week with an 8-week observation period. There were no overt signs of toxicity, making the NOAEL 250 ppm.

Generally the higher priority for selection of the key study for setting a screening level would use an inhalation study over oral studies. However, use of one of the acute studies

results in a much lower screening level, which is considered to be more health-protective. Use of the lower of the two LD50 also is more health-protective. The permit applicant was able to meet this lowest possible screening level. Therefore, best available data for setting the ITSL is the published rat oral LD50 of 2910 mg/kg, which was reported by Smyth et al (1951). The screening level can be calculated from this LD50 value using R232(1)(h) as follows.

$$\text{ITSL} = \frac{2910 \text{ mg/kg}}{500 \times 40 \times 100 \times .167} \times \frac{1 \text{ kg}}{0.9 \text{ m}^3} = 10 \text{ ug/m}^3 \text{ annual average}$$

#### References:

Jenner et al. 1964. Food flavourings and compounds of related structure I. Acute oral toxicity. Food Cosmetics Toxicology 2 :327-43.

Smyth et al. 1951. Range - finding toxicity data: List IV. Arch Ind Hyg Occup Med 4:119-122.

Lam et al. 1996. Four weeks' inhalation exposure of rats to p-cymene affects regional and synaptosomal neurochemistry. Pharmacology and Toxicology 79:225-30.