

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

INTEROFFICE COMMUNICATION

April 28, 1999

TO: File for Methyl Amyl Alcohol (CAS #108-11-2)

FROM: Marco Bianchi, Toxics Unit, Air Quality Division

SUBJECT: Initial Threshold Screening Level

The Initial Threshold Screening Level (ITSL) for methyl amyl alcohol is 1000  $\mu\text{g}/\text{m}^3$  based on an 8 hr. averaging time. The following references or databases were searched to identify data to determine the ITSL/IRSL: IRIS, HEAST, NTP Management Status Report, RTECS, EPB-CCD, EPB library, CAS-online, NLM-online, IARC, NIOSH Pocket Guide, and ACGIH Guide.

A complete reference check was conducted for methyl amyl alcohol, but only limited information was available from documentation presented by the American Council of Governmental Industrial Hygiene (ACGIH). According to the ACGIH, Smyth et al. derived an oral  $\text{LD}_{50}$  of 2.6 g/kg for methyl amyl alcohol from a rat range-finding study. Other acute studies have shown that the toxicity of this compound seems to be time-dependent. Smyth et al. also reported that a 2-hour exposure of rats to the saturated vapor of methyl amyl alcohol (4600 ppm or 19,224  $\text{mg}/\text{m}^3$ ) resulted in no deaths, but five of six rats died after 8 hours at 2000 ppm. McOmie and Anderson exposed mice to this compound at a vapor concentration of 4600 ppm for 1 minute, 1, 4, 8.5, 10, or 15 hours. Inhalation of methyl amyl alcohol for 1 minute was associated with irritation of the respiratory passages, and for 1 hour, somnolence. Exposure for 4 or 8.5 hours caused anesthetization of seven of ten, and ten of ten mice, respectively. Exposure for 10 and 15 hours caused the death of six of ten and eight of ten mice, respectively. The dermal  $\text{LD}_{50}$  of methyl amyl alcohol in rabbits was 3.56 ml/kg; however, skin irritation was minimal.

In other ACGIH documentation, human studies by Silverman and associates reported that eye irritation occurred at an exposure of 50 ppm for 15 minutes, when subjects were exposed to various concentrations of methyl amyl alcohol. Odor was not objectionable at this concentration. Exposure at more than 50 ppm was required to cause nasal and throat irritation, and 25 ppm was estimated to be the highest concentration acceptable for 8 hours.

Based upon limited data, the ACGIH recommended a threshold limit value (TLV) of 25 ppm (104  $\text{mg}/\text{m}^3$ ) to protect against ocular irritation and to provide a wide margin of safety against the anesthetic properties observed after inhalation of this compound in animal testing. NIOSH confirmed this value by also establishing a recommended exposure level (REL) of 25 ppm, but because of rounding differences converted the

REL from 25 ppm to 100 mg/m<sup>3</sup>. In a situation such as this, Rule 232(c) states to select the lowest value of either the NIOSH-REL, or the ACGIH-TLV. Since the REL value is more conservative than the TLV, the REL will be used to derive the ITSL for methyl amyl alcohol.

*The ITSL was determined as follows:*

$$\text{NIOSH REL} = 100 \text{ mg/m}^3$$

$$100 \text{ mg/m}^3 \div 100 = 1 \text{ mg/m}^3$$

$$1 \text{ mg/m}^3 \times \frac{1000 \text{ ug/m}^3}{1 \text{ mg/m}^3} = 1000 \text{ ug/m}^3$$

**The ITSL for methyl amyl alcohol = 1000 µg/m<sup>3</sup> based on 8 hr. averaging.**

**References:**

1. Documentation of Threshold Limit Values and Biological Exposure Indices. 1991. Methyl amyl alcohol. American Conference of Governmental Industrial Hygienists (ACGIH), 6th Edition.
2. Smyth, Jr., HF et al. 1951. Range-finding toxicity data: list IV. Arch. Ind. Hyg. Occp. Med. 4:119-122.
3. McOmie, WA et al. 1949. Comparative toxicological effects of some isobutyl carbinols and ketones. U. Cal. Publ. Pharmacol. 2:217-230.
4. Silverman, L et al. 1946. Further studies on sensory response to certain industrial solvent vapors. J. Ind. Hyg. Toxicol. 28:262-266.

MB:SLB

cc: Cathy Simon, AQD