

MICHIGAN DEPARTMENT OF NATURAL RESOURCES

INTEROFFICE COMMUNICATION

July 26, 1994

TO: File for Cyclopentene (142-29-0)

FROM: Marco Bianchi

SUBJECT: Initial Threshold Screening Level

The initial threshold screening level (ITSL) for cyclopentene is  $5 \mu\text{g}/\text{m}^3$  based on an annual averaging time.

The following references or databases were searched to identify data to determine the ITSL: IRIS, HEAST, NTP Management Status Report, RTECS, EPB-CCD, EPB library, CAS-online, NLM-online, IARC, NIOSH Pocket Guide, and ACGIH Guide.

A review of the above databases provided only limited information to derive an ITSL for cyclopentene. Smyth et al., (1969) conducted an acute 4-hour inhalation study using groups of six male or female albino rats exposed to 16,000 ppm (44,584  $\text{mg}/\text{m}^3$ ). The results showed that 4 out of 6 rats died within 14 days. An actual  $\text{LC}_{50}$  was never calculated from this experiment, nor was there additional information to support using this data to establish an ITSL. Therefore, an ITSL will be derived from an oral  $\text{LD}_{50}$  study also by Smyth et al. (1969), in which groups of non-fasted Carsworth-Wistar rats were dosed one time with different concentrations of cyclopentene, ranging from 1.45 to 3.17  $\text{ml}/\text{kg}$  (1117 - 2441  $\text{mg}/\text{kg}$ ). The actual derived  $\text{LD}_{50}$  was 2.14  $\text{ml}/\text{kg}$  (equivalent to 1648  $\text{mg}/\text{kg}$ ) of cyclopentene.

An ITSL was derived as follows:

Conversion of  $\text{ml}/\text{kg}$  to  $\text{mg}/\text{kg}$ :

$$\begin{aligned} 2.14 \text{ ml/kg} \times 0.770 \text{ g/ml (density of cyclopentene)} &= 1.648 \text{ g/kg} \\ 1.648 \text{ g/kg} \times 1000 &= 1648 \text{ mg/kg.} \end{aligned}$$

$$\text{LD}_{50} = 1648 \text{ mg/kg}$$

$W_A$  = Body weight of experimental animal in kilograms (kg).

$I_A$  = Daily inhalation rate of experimental animal in cubic meters/day.

Since body weights and daily inhalation rates were not available, assume a default value of  $0.931 \text{ m}^3/\text{kg}$ .

$$\text{ITSL} = \frac{1}{500} \times \frac{1}{40} \times \frac{1}{100} \times \frac{\text{LD}_{50} \text{ mg/kg} \times W_A}{0.167 \times I_A}$$

$$\text{ITSL} = \frac{1}{500} \times \frac{1}{40} \times \frac{1}{100} \times \frac{1648 \text{ mg/kg}}{0.167 \times 0.931} = 0.0053 \text{ mg/m}^3$$

$$0.0053 \text{ mg/m}^3 \times 1000 = 5.3 \text{ or } 5 \text{ } \mu\text{g/m}^3$$

The ITSL for cyclopentene = 5  $\mu\text{g/m}^3$  based on annual averaging.

References:

Smyth, F. et al., 1969. Range-Finding Toxicity Data: List VII. Am. ind. Hyg. Assoc. J. 30:470-476.

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