

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

INTEROFFICE COMMUNICATION

August 5, 1998

TO: File for Propylamine (CAS #107-10-8)

FROM: Marco Bianchi, Toxics Unit, Air Quality Division

SUBJECT: Initial Threshold Screening Level

The initial threshold screening level (ITSL) for propylamine is $112 \mu\text{g}/\text{m}^3$ 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 complete reference check was conducted for propylamine, but only two studies were available for review. The first study was an acute oral range-finding toxicity study by Smyth et al. (1962). Groups of five male or female rats were given a single dose of propylamine in a logarithmic series by gastric intubation. The animals were observed for 14 days, and the LD_{50} value was estimated by the method of Thompson. The LD_{50} for propylamine was determined to be 570 mg/kg.

In an acute inhalation study by Hine et al., groups of five Long-Evans strain rats were given single exposures to graded concentrations (400, 800, 1600, and 3200 ppm) of propylamine for eight hours. All animals were closely watched during the immediate exposure period, and observed over a period of ten days following exposure for signs of toxicity. Propylamine had no apparent effect on rats except at the highest concentration 3200 ppm. Some of the rats became dyspneic, and all died in the chamber. There were no gross tissue changes in any group, but microscopically, central pallor of the liver and tubular degeneration of the kidney were seen at 400, 800, and 1600 ppm. There was also lymphocytic infiltration of the lung in one rat exposed to 1600 ppm. In spite of rapid death of all the rats, there was central degeneration of the liver and focal lymphocytic infiltration of the heart at 3200 ppm. The LC_{50} was determined to be 2310 ppm ($5586.5 \text{ mg}/\text{m}^3$). This LC_{50} will be used to derive the ITSL.

The ITSL was derived as follows:

$$\text{LC}_{50} = 2310 \text{ ppm}$$

Conversion of ppm to mg/m³
$$\text{mg/m}^3 = \frac{\text{ppm} \times \text{Molecular Weight}}{24.45}$$

$$\text{mg/m}^3 = \frac{2310 \text{ ppm} \times 59.13}{24.45}$$

$$\text{LC}_{50} = 5586.5 \text{ mg/m}^3$$

$$\text{ITSL} = \frac{5586.5 \text{ mg/m}^3}{500 \times 100} = 0.11173 \text{ mg/m}^3$$

$0.112 \text{ mg/m}^3 \times 1000 = 112 \text{ ug/m}^3$ based on annual averaging.

The ITSL for propylamine = 112 ug/m^3 based on annual averaging.

References:

Smyth, HF. et. al., 1962. Range-Finding Toxicity Data: List VI. American Industrial Hygiene Association Journal. 23:95-107.

MB:SLB

cc: Mary Lee Hultin, AQD