

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

INTEROFFICE COMMUNICATION

July 11, 2000

TO: Isobutyric acid file (CAS # 79-31-2)
FROM: Gary Butterfield, Toxics Unit, Air Quality Division
SUBJECT: Screening level for isobutyric acid

An Initial Threshold Screening Level (ITSL) of 0.9 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) based on an annual averaging time is being established at this time for isobutyric acid.

An April 14, 2000 Chemical Abstract Service search, and an April 12, 2000 National Library of Medicine search, found very few toxicity studies that could provide the basis for screening level development. A review of some secondary toxicity references was also conducted (American Council of Governmental Industrial Hygienists, National Toxicology Program, Integrated Agency for Research on Cancer, Agency for Toxic Substance and Disease Registry, Environmental Protection Agency's Integrated Risk Information System, etc.) with no toxicity studies located that could be used as the basis for the screening level.

An acute oral study reported by Smyth et al (1962) provides the best information upon which the screening level could be based. The rat oral Lethal Concentration 50 (LD50) was reported to be 0.28 milliliter per kilogram (ml/kg), which can be converted to a dose of 265 milligram per kilogram (mg/kg) based on the specific gravity of 0.948 grams per milliliter (g/ml). Groups of five male Carworth-Wistar rats were administered a single gavage dose of undiluted substance. The rats were observed for 14 days following dose administration. The LD50 was calculated by the method of Thompson.

The ITSL can be calculated from this LD50 and the equation in R 232(h) as follows.

$$\text{ITSL} = \frac{(265 \text{ mg/kg})}{(500 \times 100 \times 40 \times 0.167)} \times \frac{1 \text{ kg}}{0.9 \text{ m}^3} = 0.9 \mu\text{g}/\text{m}^3 \text{ with annual averaging}$$

The default inhalation rate for rats of $0.9 \text{ m}^3/\text{kg}$ was used to derive this ITSL.

References:

Smyth et al. 1962. Range finding toxicity data: List VI. Am Indust Hyg Assoc J 23:95-107.

GB:SLB

cc: Cathy Simon, AQD
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