

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

INTEROFFICE COMMUNICATION

June 20, 2002

TO: Isovaleraldehyde File (CAS # 590-86-3)  
FROM: Gary Butterfield, Toxics Unit, Air Quality Division  
SUBJECT: Screening Level for Isovaleraldehyde

Isovaleraldehyde is also known as 3-methylbutanal, isoamylaldehyde, isopentanal, and isopentaldehyde. Physical properties find that isovaleraldehyde is a liquid with a density of 0.796 g/cm<sup>3</sup>, a molecular weight of 86.13, a melting point of -60 degrees C, and a boiling point of 90 degrees C. The vapor pressure is reported in Patty's Industrial Hygiene to be approximately 50 mmHg at 25 degrees C.

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 (1993- March 2002), National Library of Medicine (NLM) - Toxline, and National Toxicology Program (NTP) Status Report.

The CAS and NLM on-line literature searches were conducted on April 10, 2002. Little toxicity information on this chemical was located during the literature searches. Several acute studies were located during the search. However, most of the available acute duration studies did not result in calculation of an oral LD-50 or inhalation LC-50, due to only one dose group being studied for some effect other than lethality.

The only study of the located acute studies was of adequate quality for use to determine the screening level. These are the acute toxicity values reported by Carpenter et al (1974). The Carpenter et al study reports an oral LD-50 of 7.1 g/kg and an inhalation LC-50 of 42.7 mg/L for isovaleraldehyde.

While both an oral and inhalation acute toxicity value are available, it is considered more appropriate to utilize the inhalation LC-50 to calculate the screening level over the use of the oral LD-50, in order to avoid any possible route extrapolation issues. Therefore, the ITSL can be calculated from the equation in R232(1)(f) using the 4-hour LC-50 of 42.7 mg/L as follows:

$$\text{ITSL} = \frac{42.7 \text{ mg/L}}{500 \times 100} = 800 \text{ } \mu\text{g/m}^3 \text{ with annual averaging}$$

**References**

Carpenter et al. 1974. Range - finding toxicity data: List VIII. Toxicol Appl Pharm 28:313-9.

GB:DB

cc: Cathy Simon, AQD  
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