

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

INTEROFFICE COMMUNICATION

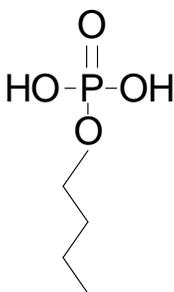
September 12, 2000

TO: File for Monobutyl Phosphoric Acid (CAS #1623-15-0)
FROM: Michael Depa, Toxics Unit, Air Quality Division
SUBJECT: Screening Level Determination

The initial threshold screening level (ITSL) for monobutyl phosphoric acid is 15 µg/m³ based on annual averaging time.

The following references or databases were searched to identify data to determine the screening level: U.S. EPA Integrated Risk Information System (IRIS), Registry for Toxic Effects of Chemical Substances (RTECS), American Conference of Governmental and Industrial Hygienists (ACGIH) Threshold Limit Values (TLVs), National Institute for Occupational Safety and Health (NIOSH) Pocket Guide to Hazardous Chemicals, Environmental Protection Bureau Library, International Agency for Research on Cancer (IARC) Monographs, Chemical Abstract Service (CAS) Online (1967- June, 2000), National Library of Medicine (NLM), Health Effects Assessment Summary Tables (HEAST), and National Toxicology Program (NTP) Status Report. The EPA has not established a reference concentration (RfC) or reference dose (RfD) monobutyl phosphoric acid. The molecular weight of monobutyl phosphoric acid is 154g. The molecular formula is C₄H₁₁O₄P. The molecular structure is shown in Figure 1.

Figure 1. Molecular Structure of Monobutyl Phosphoric Acid



Toxicity Information

Groups of 5 Sprague-Dawley, albino rats were gavaged with 1000, 2150, or 4640 mg monobutyl phosphoric acid per kilogram of body weight and observed for 14 days (EPA, 1991). Mortality (2 of 5 rats) occurred only in the 4640 mg/kg dose group. The author stated that animals treated at this dose level exhibited signs of acute depression. Fatalities exhibited gastro-intestinal hemorrhage. The author stated that survivors appeared normal when necropsied 14 days after treatment.

Development of Screening Level

Since only 40% mortality occurred in the 4640 mg/kg dose group a lethal dose 50% (LD50) could not be developed from the EPA (1991) study. However, a surrogate LD50 of 4640mg/kg was assumed for the purposes of developing a screening level.

The ITSL was calculated according to Rule 232(1)(h). The average body weight (W_a) and the inhalation rate (I_a) of the male rat was obtained from EPA, 1988.

$$\text{ITSL} = 1/(500 \times 40 \times 100) \times \text{LD50}/(0.167) \times W_a/I_a$$

$$\text{ITSL} = (5 \times 10^{-7}) \times (4640 \text{ mg/kg})/(0.167) \times (0.47 \text{ kg})/(0.43 \text{ m}^3)$$

$$\text{ITSL} = 0.01518 \text{ mg/m}^3$$

$$\text{ITSL} = 15 \text{ } \mu\text{g/m}^3 \text{ (annual averaging time)}$$

The ITSL for monobutyl phosphoric acid is 15 $\mu\text{g/m}^3$ based on annual averaging time.

References

EPA. 1988. Recommendation for and documentation of biological values for use in risk assessment. PB-88-179874.

EPA. 1991. Letter to USEPA concerning enclosed confidential and sanitized copy of the health safety study on butyl acid phosphate with attachments (sanitized). USEPA, TSCA 8d Documents. Microfiche No. OTS0529174, New Doc I.D. 86-310000740S.

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