

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

INTEROFFICE COMMUNICATION

July 2, 1997

TO: File for Propylene Glycol Phenyl Ether (1-phenoxy-2-propanol) (CAS #770-35-4)

FROM: Robert Sills

SUBJECT: Initial Threshold Screening Level

The available toxicological literature was reviewed for the subject chemical, including the on-line databases CAS, Biosis, Toxline, and RTECS. It should be noted that there exists a similar compound which may also be referred to as propylene glycol phenyl ether, but which is structurally different from the subject chemical; that substance is 2-phenoxy-1-propanol (CAS # 4169-04-4).

The published literature does not contain any study which would serve as an appropriate basis for a screening level for 1-phenoxy-2-propanol. The Dow Chemical Company has submitted to MDEQ-AQD unpublished Dow studies which were considered. Abbreviated reporting of the results of a 7-hour rat inhalation study indicate that a group of 5 rats had no pathology or mortality 14 days following a 7-hour exposure to Dowanol PPH Glycol Ether (1-phenoxy-2-propanol) heated to 100 C (Calhoun, 1996, 1997; Dow, 1968). The exposure level was unmeasured, but may have been as high as the reported saturation level at 100 C, which is reported by Dow as $> 53,000 \text{ mg/m}^3$ (Calhoun, 1996). This study was not selected as the basis for ITSL development because an LC_{50} was not determined, and the exposure level was not adequately measured or estimated.

The most appropriate basis for ITSL development is an unpublished oral rat LD_{50} study provided by Dow (1968). In that study, groups of 5 male or female rats (strain not specified) were dosed orally (apparently via gavage) with undiluted Dowanol PPH (1-phenoxy-2-propanol) and observed for 15 days. Six exposure levels were used. The LD_{50} s were calculated to be 2.83 g/kg for the males (confidence limits 1.77 - 4.53) and 3.73 g/kg for the females (confidence limits 2.42 - 5.74). The ITSL is derived from the lower of these LD_{50} values, 2.83 g/kg for the males. The average body weight of the male rats at the start of the study is calculated as 0.273 kg. Per Rule 232 (h), an ITSL derived from an LD_{50} requires an estimate of the inhalation rate. Since the strain of rats is not specified in the key study, the inhalation rate may be estimated based on the average body weight and the allometric relationship for the inhalation rate of rats (strain unspecified) from EPA (1988):

$$I (\text{m}^3 / \text{d}) = 0.80 W^{0.8206} = 0.80 (0.273 \text{ kg})^{0.8206} = 0.27 \text{ m}^3/\text{d}$$

Therefore, the ITSL is derived as follows:

$$\text{ITSL} (\text{mg/m}^3) = \frac{1}{500} \times \frac{1}{40} \times \frac{1}{100} \times \frac{2830 \text{ mg/kg} \times 0.273 \text{ kg}}{0.167 \times 0.27 \text{ m}^3/\text{d}}$$

$$= 0.00857 \text{ mg/m}^3 = 8. \text{ ug/m}^3 \text{ (annual averaging time)}$$

The ITSL is 8 ug/m^3 with an annual averaging time.

References:

Calhoun, L. L. 1996. Memorandum from L. L. Calhoun, The Dow Chemical Company, to Robert Sills, MDEQ-AQD, December 19, 1996.

Calhoun, L. L. 1997. Memorandum from L. L. Calhoun, The Dow Chemical Company, to Robert Sills, MDEQ-AQD, June 10, 1997.

The Dow Chemical Company. 1968. Toxicological Properties and Industrial Handling Hazards of Dowanol Pph (1-Phenoxy-2-Propanol). Unpublished report.

USEPA. 1988. Recommendations for and Documentation of Biological Values for Use in Risk Assessment. PB 88-179874.