

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

INTEROFFICE COMMUNICATION

September 6, 2000

TO: File for Terpene Hydrocarbons (68956-56-9)
FROM: Marco Bianchi
SUBJECT: Initial Threshold Screening Level

The initial threshold screening level (ITSL) for terpene hydrocarbons (Glidsol 180) is $11 \mu\text{g}/\text{m}^3$ based on an annual averaging time. AQD staff initially evaluated this compound in 1999, but due to a paucity of data, the screening level was set at trace ($0.1 \text{ ug}/\text{m}^3$ annual averaging). Since that time, an oral rat LD_{50} toxicity study sponsored and submitted by Millennium Specialty Chemicals has provided adequate information to establish an ITSL for this compound.

In the Millennium Specialty Chemical study, two groups of five male and three groups of five female Sprague-Dawley rats were dosed at 2.5 (male and female), 3.54 (female only), or 5.0 g/kg body weight (male and female) with Glidsol 180 by oral gavage in a single application. Following dosing, the test animals were observed frequently for five hours and then twice daily for 14 days for pharmacotoxic signs and mortality. At the end of the observation period, survivors were terminated and underwent gross necropsy.

The most frequent sign at all dose levels was decreased activity. Perineal staining was also observed, most frequently in females. Survivors usually resumed normal activity within 24 to 48 hours after being dosed, but perineal staining frequently lasted for several days. At necropsy, rats that died during the study developed livers that were mottled or clayish in color, and congestion of the intestines. Other dose-related effects were renal pallor, bladder distention, and cyanosis of the toenail beds. Infrequent dose-related effects were hematuria, ocular opacity, and congestion of the stomach. There was no mortality at the 2.5 g/kg level, 60% mortality at the 3.54 g/kg level, and 90% mortality at 5.0 g/kg. The LD_{50} was determined to be 3.54 g/kg for female test animals using the methods of Weil (1952).

The ITSL was derived as follows:

$$\text{LD}_{50} = 3540 \text{ mg/kg}$$

$$\text{ITSL} = \frac{1}{500} \times \frac{1}{40} \times \frac{1}{100} \times \frac{3540}{0.167 \times 0.972} = 0.0109 \text{ mg}/\text{m}^3$$

$$0.0109 \text{ mg}/\text{m}^3 \times 1000 = 10.9 \text{ ug}/\text{m}^3 \text{ based on annual averaging.}$$

The ITSL for terpene hydrocarbons = $11 \text{ ug}/\text{m}^3$ based on annual averaging.

References:

Robbins, G. 1991. Test article: Glidsol 180 C.S.E. #S1672-03. Acute Oral Toxicity in Rats. Cosmopolitan Safety Evaluation, Inc. Study #A3116. April 16, 1991.

Weil, C.S. 1952. 'Tables for Convenient Calculation of Median Effective Dose', Biometrics 8, 249-263, as printed in Hayes, principals and Methods in Toxicology, 2nd. Ed (1989).

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