

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

INTEROFFICE COMMUNICATION

October 7, 2003

TO: File for distillates (petroleum), light catalytic cracked (64741-59-9)
FROM: Marco Bianchi
SUBJECT: Initial Threshold Screening Level

The initial threshold screening level (ITSL) for *distillates (petroleum), light catalytic cracked* is 93 µg/m³ based on an annual averaging time.

The following references or databases were searched to identify data to determine the ITSL: IRIS, HEAST, NTP Management Status Report on-line, RTECS, EPBCCD, EPB library, CAS-online, NLM-online, IARC on-line, NIOSH Pocket Guide, and ACGIH Guide.

A definition of this petroleum hydrocarbon distillate is provided by the Toxic Substance Control Act (TSCA) Chemical Substance Inventory (Initial Inventory; Volume 1; 1979):

"distillates (petroleum), light catalytic cracked is a complex combination of hydrocarbons produced by the distillation of products from a catalytic cracking process. It consists of hydrocarbons having carbon numbers predominately in the range of C₉ through C₂₅ and boiling in the range of approximately 150°C to 400°C (302°F to 752°F)." It contains a relatively large proportion of bicyclic aromatic hydrocarbons."

A complete reference check was conducted for *distillates (petroleum), light catalytic cracked*, but only an acute rat LC₅₀ study was available to derive an ITSL. This study was submitted to EPA through the TSCA 8(e) submittal process and obtained from the EPA TSCA library. According to the study, five rats of each sex were exposed to a target aerosol concentration of 5 mg/L for 4 hours. No animals died during the exposure to a time weighted average concentration of 5 mg/L; however, three males and one female died during the 14-day observation period, necessitating another phase of testing in an attempt to define the LC₅₀. Five additional groups of five male and five female rats each were exposed to target concentrations from 0 (air only control) to 7.5 mg/L.

Analysis of aerosol concentrations during animal exposures was performed gravimetrically and yielded concentrations of 0, 2.34, 3.47, 6.34, and 7.29 mg/L. No control animals died, but one male at 2.34 mg/L, one female at 3.47 mg/L and all ten animals at 7.29 mg/L died one to two days post exposure to *distillates (petroleum), light catalytic cracked*.

Individual and mean body weight gains were depressed in dose related fashion following exposure to the test material. Histopathological examination of the lung tissues yielded dose related morphological changes consistent with hydrocarbon toxicity. An LC₅₀ of 4.65 mg/L was calculated for both male rats and combined male and female rats. The 95% confidence limits of this LC₅₀ for the combined sexes were 3.89 to 5.55 mg/L.

The ITSL was determined as follows:

$$LC_{50} = 4.65 \text{ mg/L}$$

$$4.65 \text{ mg/L} \times 1000 \text{ L/m}^3 = 4650 \text{ mg/m}^3$$

$$\text{ITSL} = \frac{4650}{500 \times 100} = 0.093 \text{ mg/m}^3$$

$$0.093 \text{ mg/m}^3 \times 1000 = 93 \text{ ug/m}^3 \text{ based on annual averaging.}$$

The ITSL for *distillates (petroleum), light catalytic cracked* = 93 ug/m³ based on annual averaging.

References

1. TSCA 8(e) submittal. 1985. Acute inhalation toxicity evaluation of a petroleum derived hydrocarbon (compound API No. 83-08) in rats. Litton Bionetics, Inc. Project No. 22235-06, August 1985. EPA/OTS; Doc #FYI-AX-1085-0411.
2. TSCA. 1979. Toxic Substance Control Act Chemical Substance Inventory (Initial Inventory; Volume 1. U.S. EPA, Office of Toxic Substances, Washington, DC 20460, May 1979.