

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

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INTEROFFICE COMMUNICATION

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January 10, 2002

TO: Heavy Catalytic Reformed Naphtha File (CAS #64741-68-0)

FROM: Gary Butterfield, Toxics Unit, Air Quality Division

SUBJECT: Screening Level for Heavy Catalytic Reformed Naphtha

Heavy catalytic reformed naphtha (CAS #64741-68-0) can be described as being a complex hydrocarbon mixture containing predominantly aromatic hydrocarbons with carbon chains of 7 to 12 carbons and boiling in the range of 90 to 230 degrees Celsius. Some synonyms for this material include API-83-06, and aromatic mineral spirits among many others.

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 (1967- Jan, 2001), National Library of Medicine (NLM) - Toxline, and National Toxicology Program (NTP) Status Report.

A January 25, 2001 CAS and NLM on-line literature search was conducted. The CAS search got no hits. The standard secondary toxicity references (see above) did not have any toxicity data for this CAS number. The NLM search found several unpublished toxicity studies that have been conducted with this material that have been submitted to EPA under the ToSCA program. Three of the unpublished studies were mutagenicity assays. Two of the studies (Litton Bionetics (1985), Microbiological Associates (1985)) found no increase in chromosomal aberrations following exposure to heavy catalytic reformed naphtha. In a TK mouse lymphoma assay [Microbiological Associates (1986)], there was an 'equivocal' mutagenic response. There also were a couple of unpublished acute inhalation studies identified in the NLM search. In one study [Litton Bionetics (1984)], no rats died at an exposure level of 5 mg/L. In the other acute study [IIT Research Institute (1982)], the LC-50 was determined to be 31.1 mg/L for male rats and 23.9 mg/L for females. In addition to the acute studies, one 3-week rat inhalation toxicity study was also identified which was reported by IIT Research Institute (1983).

For the purpose of establishing a screening level, it is generally considered to be more appropriate to use a longer-term exposure study than an acute study as the basis for the screening level. In the IIT Research Institute 3 week study, groups of 10 male and 10 female Sprague-Dawley rats were exposed to vapors of heavy catalytic reformed naphtha for 6 hours a day, 5 days a week for 3 weeks. The various measured concentrations used were 0, 1.03, 2.81 and 10.18 mg/L. The high dose level resulted in 15 of 20 rats dying. The middle dose resulted in decreased body weight gains, and an increased liver-body weight ratio. There was no chemical exposure pathology changes observed in the middle and low dose levels. The lowest dose level (1.03 mg/L or 1030 mg/m<sup>3</sup>) had no effects reported and is, therefore, considered to

be the NOAEL. Based on the reduced body weight and increased liver weights found in the middle dose level, that dose level is considered to be the LOAEL.

The ITSL can be calculated from the NOAEL using R232(1)(d) as follows:

$$\text{ITSL} = \frac{(1030 \text{ mg/m}^3)}{35 \times 100} \times \frac{6}{24} = 70 \text{ } \mu\text{g/m}^3 \text{ with annual averaging}$$

References:

IIT Research Institute. 1982. Acute inhalation toxicity study of heavy catalytic reformed naphtha in rats. Study # L8100SN332A. EPA/OTS doc # 88-920000941

IIT Research Institute. 1983. Three-week inhalation toxicity study of heavy catalytic reformed naphtha in rats. EPA/OTS doc # 88-920000983

Litton Bionetics. 1984. Acute inhalation toxicity evaluation of petroleum derived hydrocarbon (API 83-06) in rats. LBI project # 22235-04. EPA/OTS doc # FYI-AX-1184-0359

Litton Bionetics. 1985. Mutagenicity evaluation of API 83-06 in the rat bone marrow cytogenetic assay. LBI project # 22259. EPA/OTS doc # FYI-AX-1183-0285

Microbiological Associates. 1985. Activity of API 83-06 in the acute in vivo cytogenetics assay in male and female rats. Study # T2420.105001 EPA/OTS doc # FYI-AX-0584-0317

Microbiological Associates. 1986. L5178Y TK+/- mouse lymphoma mutagenesis assay in API 83-06. MBA study # 2420.701. EPA/OTS doc # FYI-AX-1185-0317

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