

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

INTEROFFICE COMMUNICATION

June 11, 1999

TO: File for Naphtha, Heavy Catalytic Cracked (CAS No. 64741-54-4)  
FROM: Michael Depa  
SUBJECT: Initial Threshold Screening Level

The initial threshold screening level for naphtha, heavy catalytic cracked is 115  $\mu\text{g}/\text{m}^3$  (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- April 27, 1999), 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) for heavy catalytic cracked naphtha. There were no occupational limits available. The average molecular weight of for heavy catalytic cracked naphtha is 99g. Vapor pressure is 50 mmHg at 100°F.

The CAS Registry file for 64741-54-4 defines “naphtha (petroleum), heavy catalytic cracked” as:

A complex combination of hydrocarbons produced by a distillation of products from a catalytic cracking process. It consists of hydrocarbons having carbon numbers predominantly in the range of C6 through C12 and boiling in the range of approximately 65°C to 230°C (148°F to 446°F).

The following data was obtained from an MSDS provided by Marathon Oil:

Paraffins	35-45%
Olefins	30-40%
Aromatic Hydrocarbons	20-30%
Benzene	0.1-1%

In a four-week oral nephrotoxicity screening study, groups of 10 male F344 rats received daily doses of 0.5 g/kg or 2.0 g/kg by gavage five days per week (a total of 20 administrations) (API, 1984). On the morning of the day immediately following the twentieth administration of the test or control material, the study animals were sacrificed. At necropsy, the kidneys were freed of perirenal and connective tissue, weighed, and sliced longitudinally. Two sections were made from each kidney. The toxicological endpoints reported from this study are summarized in Table 1.

**Table 1. Effects of 0.5 and 2.0 g/kg/day on Male Rats after a 4 Weeks (API, 1984)**

Effect	Control Rats	0.5 g/kg	2.0 g/kg
Hyaline Droplet Change	10/10	10/10	10/10
Regenerative Epithelium	10/10	10/10	10/10
Tubular Dilatation/Granular Material	ng <sup>1</sup>	ng	ng
Mononuclear Cell Infiltrate	4/10	8/10	7/10
Hyaline Casts	ng	3/10	3/10
Pelvic Epithelial Hyperplasia	ng	ng	1/10
Cortical Cyst	ng	ng	1/10

<sup>1</sup> ng = not given, assumed to be 0/10 or not observed.

Unfortunately this 4 week nephrotoxicity study (API, 1984) did not describe the following toxicological endpoints: clinical observations, body weight, organ weight, histopathology (other than renal histopathology) or clinical chemistry. Since the shortcomings of this study were too numerous it was determined that this study was unacceptable for use in the derivation of a screening level.

In an acute inhalation study, five Sprague-Dawley CD rats of each sex were exposed to a vapor concentration of 5.74 mg/L of heavy catalytic cracked naphtha for 4 hours (API, 1987). No animals died or exhibited clinical signs during the course of the exposures or during the 14-day observation period. No toxic signs of any significance were seen in animals of either sex that could be attributed to exposure. The authors stated that histopathological examination of the lung tissues yielded minimal pulmonary findings, none that could be attributed to exposure of these animals to heavy catalytic cracked naphtha. An LC50 could not be determined since there were no deaths observed at the 5.74 mg/L dose. However, for the purpose of developing an ITSL, the exposure concentration was considered an LC50. The ITSL was calculated according to Rule 232(1)(f) as follows:

$$\text{ITSL} = \text{LC50}/(500 \times 100)$$

$$\text{ITSL} = (5.74 \text{ mg/L})/(50,000)$$

$$\text{ITSL} = 0.000115 \text{ mg/L}$$

$$\text{ITSL} = 0.000115 \text{ mg/L} \times 1000 \text{ L/m}^3 \times 1000 \text{ } \mu\text{g/mg}$$

$$\text{ITSL} = 115 \text{ } \mu\text{g/m}^3$$

The initial threshold screening level (ITSL) for heavy catalytic cracked naphtha is 115  $\mu\text{g/m}^3$  with an annual averaging time.

## **REFERENCES:**

API, 1984. Four-week oral nephrotoxicity screening study in male F-344 rats, Phase III. American Petroleum Institute. Neill K. Weaver, M.D. F.A.C.P. Obtained from United States Environmental Protection Agency, Office of Toxic Substances. Microfiche No. 0280A. EPA/OTS Document ID: FYI-AX-0784-0282SU

API. 1987. Acute inhalation toxicity evaluation of a petroleum derived hydrocarbon in rats API 83-18 heavy catalytic cracked naphtha (64741-54-4), final report. American Petroleum Institute, 1220 L Street Northwest, Washington DC 20005. Obtained from US Environmental Protection Agency, Office of Toxic Substances. EPA/OTS Doc# FYI-AX-0887-0411 (microfiche no. OTS0000411-4)