

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

INTEROFFICE COMMUNICATION

January 30, 2004

TO: File for n,n-dimethyl-p-toluidine (99-97-8)

FROM: Marco Bianchi

SUBJECT: Initial Threshold Screening Level

The initial threshold screening level (ITSL) for n,n-dimethyl-p-toluidine (DMPT), is 28 $\mu\text{g}/\text{m}^3$ 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-online, RTECS, EPBCCD, EPB library, CAS-online, NLM-online, IARC-online, NIOSH Pocket Guide, and ACGIH Guide.

A complete reference check was conducted for DMPT, but only one study was available for review. This study was an acute inhalation LC_{50} TSCA 8(e) submittal conducted by Chemfirst, Inc. In this study, DMPT was aerosolized and administered for 4-hr by whole-body inhalation exposure to four treatment groups, each consisting of five male and five female Sprague-Dawley rats. Animals were exposed to a concentration of 5.27, 1.73, 0.99, and 0.30 mg/l. Aerosol particle size ranged from 0.23 to 0.57 μm Mass Median Aerodynamic Diameter (MMAD). Exposure of the animals was followed by a 14-day observation period. No rats survived a 4-hour exposure to 5.27 mg/l. Exposure to 0.30 or 0.00 mg/l produced no mortality, while exposure to 1.73 mg/l produced 60% mortality in male rats and 100% mortality in female rats. Clinical signs in rats exposed to 1.73 mg/l included hypoactivity, a comatose/prostrate condition, dyspnea or rapid respiration and salivation. The most frequently observed signs in rats exposed to 0.99 or 0.30 mg/l were nasal discharge and red material around the nose, but dyspnea was also reported for several rats from the 0.30 mg/l group. For groups in which animals survived, body weight gain was similar between groups of the same sex. Mottled lungs, red ovaries and gas-filled gastrointestinal organs were the most frequent gross lesions in rats exposed to 5.27 or 1.73 mg/l. No gross lesions were observed in rats exposed to lower concentrations. The LC_{50} was estimated to be 1.4 mg/l.

The ITSL was derived as follows:

$$\text{LC}_{50} = 1.4 \text{ mg/l}$$

Conversion of mg/l to mg/m³

$$\text{mg/m}^3 = 1.4 \text{ mg/l} \times 1000 = 1400 \text{ mg/m}^3$$

$$\text{LC}_{50} = 1400 \text{ mg/m}^3$$

$$\text{ITSL} = \frac{1400 \text{ mg/m}^3}{500 \times 100} = 0.028 \text{ mg/m}^3$$

$0.028 \text{ mg/m}^3 \times 1000 = 28 \text{ ug/m}^3$ based on annual averaging.

The ITSL for n,n-dimethyl-p-toluidine = 28 ug/m^3 based on annual averaging.

References:

1. TSCA 8(e) submittal. 1993. 88-970000118S. Initial Submission: Letter from Chemfirst Inc to US EPA RE: Inhalation toxicity study of n,n-dimethyl-p-toluidine w/attachemtns and cover letter dated 01/22/1997. OTS0573706.