

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

INTEROFFICE COMMUNICATION

TO: File for o-chlorotoluene [CAS# 95-49-8]
FROM: Doreen Lehner, Toxics Unit, Air Quality Division
DATE: January 12, 2017
SUBJECT: o-chlorotoluene [CAS# 95-49-8] ITSL change in the averaging time from 24 hours to annual

The current ITSL for o-chlorotoluene ($70 \mu\text{g}/\text{m}^3$) has a justification (attached) dated April 19, 2001. The averaging time (AT) assigned at that time was 24 hours, as per the default methodology (Rule 232(2)(b)). The current file review concludes that the AT may appropriately be set at annual, as the basis for the screening level is an EPA oral reference dose (RfD) of 0.2 mg/kg/day. The EPA RfD was derived from a 15-week oral gavage study in rats. Therefore, the AT is being changed from 24 hours to annual at this time.

References:

APCR. 2016. Air Pollution Control Rules, Promulgated pursuant to Part 55, Air Pollution Control, of the Natural Resources and Environmental Protection Act, Michigan Department of Environmental Quality. 1994. Act 451, as amended (NREPA).

EPA. 2001. Integrated Risk Information System (IRIS). U.S. EPA IRIS substance file – o-chlorotoluene; CASRN 95-49-8; reference dose for chronic oral exposure (RfD); 02/01/1990.

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

INTEROFFICE COMMUNICATION

April 19, 2001

TO: File for o-chlorotoluene (95-49-8)

FROM: Marco Bianchi

SUBJECT: Initial Threshold Screening Level

The final Initial Threshold Screening Level (ITSL) for ortho-chlorotoluene (OCT) is $70 \mu\text{g}/\text{m}^3$ based on a 24-hour averaging time. The Air Quality Division (AQD) staff initially evaluated this compound in 1994 using interim ITSL procedures to derive a permissible impact of $2590 \mu\text{g}/\text{m}^3$ and $70 \mu\text{g}/\text{m}^3$ for an 8-hour and 24-hour averaging time, respectively. In an effort to finalize all interim chemical screening levels, this chemical was re-reviewed to set a final ITSL. The following references or databases were searched to identify data to determine the ITSL: IRIS-online, HEAST, NTP Management Status Report-online, RTECS, EPB-CCD, EPB library, CAS-online, NLM-online, IARC-online, NIOSH Pocket Guide, and ACGIH Guide.

During a complete re-review of OCT, a rat developmental study was obtained to compare with the 8- and 24-hour value studies. Although this developmental study used good protocol standards, the resultant NOAEL would produce a higher ITSL than the other studies. Therefore, the 8- and 24-hour values provided the best available data to establish an ITSL. A review of the respective studies is provided below.

The EPA's Integrated Risk Information System (IRIS) oral reference dose (RfD) of 0.02 mg/kg/day for OCT was based on a 15-week oral gavage study in rats. A total of 20 Harlan rats/sex/group were dosed at 0, 20, 80, or 320 mg/kg/day for 104 days. At doses of 80 and 320 mg/kg/day, male rats developed a statistically significant decrease in mean body weight gain and an increase in adrenal weight. Additionally at the 80 mg/kg/day dose, blood urea nitrogen was increased in males. No histological changes related to intake of OCT were seen in this investigation. A NOAEL (no-observable-adverse-effect-level) of 20 mg/kg/day was indicated for this study which resulted in a RfD of 0.2 mg/kg/day.

The American Council of Governmental Industrial Hygienists (ACGIH) listed an occupational exposure level of 50 ppm (or $259 \text{ mg}/\text{m}^3$) for OCT. According to the ACGIH-Threshold Limit Value (TLV) sub-committee, this number is based on what is thought to be good industrial hygiene practice, but little data exist to support this or any value. Industry communications obtained by the ACGIH have mentioned that no cases of skin irritation or other forms of poisoning due to contact with, or inhalation of OCT have ever been encountered in the industrial setting.

According to AQD Rules governing ITSL derivations, data derived from an EPA RfD takes precedence over data derived from an occupational exposure level. Additionally, Rule 232(1)(b) states that an ITSL shall be determined from an oral reference dose (RfD) from the best available information provided that none of the data showed that oral to inhalation route extrapolation is inappropriate. The OCT studies have shown that both oral and short-term inhalation adverse effects have included decreases in body weights resulting in increased relative organ weights, changes in clinical chemistry and hematological values. Therefore, it

seems appropriate to use the OCT RfD to derive an ITSL since the adverse effects from oral exposures were similar to inhalation exposures.

The ITSL was determined as follows:

EPA's RfD = 0.02 mg/kg/day

Conversion from mg/kg to mg/m³

$$0.02 \text{ mg/kg} \times \frac{70 \text{ kg}}{20 \text{ m}^3} = 0.07 \text{ mg/m}^3$$

Conversion from mg/m³ to ug/m³

$$0.07 \text{ mg/m}^3 \times \frac{1000 \text{ } \mu\text{g}}{1 \text{ mg}} = 70 \text{ } \mu\text{g/m}^3$$

The ITSL for benzoin = 70 $\mu\text{g/m}^3$ based on a 24-hour averaging time.

References:

1. Integrated Risk Information System (IRIS). 2001. U.S. EPA IRIS substance file – o-chlorotoluene; CASRN 95-49-8; reference dose for chronic oral exposure (RfD); 02/01/1990.
2. Documentation of Threshold Limit Values and Biological Exposure Indices. 1992. o-Chlorotoluene. American Conference of Governmental Industrial Hygienists (ACGIH), 6th Edition.

MB:DB

cc: Cathy Simon, AQD
Mary Lee Hultin, AQD
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