

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

INTEROFFICE COMMUNICATION

TO: File for Tolyltriazole (CAS # 29385-43-1)

FROM: Doreen Lehner, Toxics Unit, Air Quality Division

DATE: February 10, 2016

SUBJECT: Screening Level for Tolyltriazole (CAS # 29385-43-1)

The initial threshold screening level (ITSL) for tolyltriazole (CAS # 29385-43-1) is 2.1 $\mu\text{g}/\text{m}^3$ with an annual averaging time.

Tolyltriazole [also known as 4 (or 5)-methyl-1H-benzotriazole and methyl-1H-benzotriazole] is a light brown powder or granule with a melting point ranging from 76-87°C, a boiling point of 160°C, and a molecular weight of 159.19 g/mol. Tolyltriazole is used: as a copper corrosion inhibitor; rust and corrosion inhibitor for metals; in water treatment; and as a nitrification inhibitor of urea fertilizer in agricultural soils.

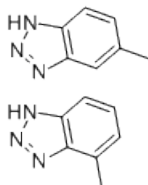


Figure 1. Structure of tolyltriazole.

A literature review was conducted to determine an initial threshold screening level (ITSL) for tolyltriazole. The following references and databases were searched to derive the above screening level: Chemical Criteria Database (CCD), United States Environmental Protection Agency (US EPA) Integrated Risk Information System (IRIS), National Institute for Occupational Safety and Health (NIOSH), American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values and Biological Exposure Indices (TLV/BEI) 2014 guide, National Toxicology Program (NTP) Study Database, International Agency for Research on Cancer (IARC), Acute Database, National Library of Medicine (NLM)-online, EPA Aggregated Computational Toxicology Resource (ACToR) Database, U.S. EPA TSCATS database, and Hazardous Substances Data Bank (HSDB).

The Environmental Protection Agency does not have a reference concentration or a reference dose for chronic oral exposure (oral RfD), and there are no occupational exposure levels for tolyltriazole or adequate repeated-dose toxicology data for ITSL

derivation. An ITSL can be derived from an oral rat LD₅₀. An LD₅₀ study conducted by Huntingdon Research Center (NTIS, 1989) found an oral rat LD₅₀ of 675 mg/kg.

According to Rule 232(1)(h), an ITSL may be determined from an animal oral LD₅₀ using the following equation:

$$ITSL = \frac{1}{500} \times \frac{1}{40} \times \frac{1}{100} \times \frac{LD_{50} \text{ mg/kg} \times W_A}{0.167 \times I_A}$$

Where W_A is the body weight of the experimental animal in kilograms (kg) and I_A is the daily inhalation rate of the experimental animal in cubic meters/day (m^3 /day). As the species and gender of rat was not described, the default weight for a non-gender rat of unknown species is 0.395 kg is used (EPA, 1988).

I_A is determined by using the equation below from EPA (1988):

$$I_A = 0.80 \times W_A^{0.8206}$$
$$I_A = 0.80 \times 0.395 \text{ kg}^{0.8206} = 0.3733 \text{ m}^3/\text{day}$$

The values for I_A , W_A , and the LD₅₀ are entered into the ITSL equation above:

$$ITSL = \frac{1}{500} \times \frac{1}{40} \times \frac{1}{100} \times \frac{675 \text{ mg/kg} \times 0.395 \text{ kg}}{0.167 \times 0.3733 \text{ m}^3/\text{day}} = 0.002138 \text{ mg/m}^3 = 2.1 \text{ } \mu\text{g/m}^3$$

Based on Rule 232(2)(c) the averaging time for this ITSL is annual. Based on the above data, the ITSL for tolyltriazole is 2.1 $\mu\text{g/m}^3$ with an annual averaging time.

References:

APCR. 2013. 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. 1988. Recommendation for and documentation of biological values for use in risk assessment. PB-88-179874.

NTIS. 1989. Doc ID 86-890000605. National Technical Information Service. Springfield, VA 22161. Huntingdon Research Center. Acute Oral LD₅₀ Investigation in Rats of Cobratec TT 100 Sample #5459 with Cover Letter Dated 061289.

DL:lh