

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

INTEROFFICE COMMUNICATION

December 13, 2016

TO: File for benzocyclobutene (CAS No. 694-87-1)
FROM: Mike Depa, Air Quality Division, Toxics Unit
SUBJECT: Initial Threshold Screening Level

The Initial Threshold Screening Level (ITSL) for benzocyclobutene is 220 $\mu\text{g}/\text{m}^3$ with an annual averaging time.

A summary of a toxicity study was provided by Dow Chemical Company (1991).

Ten Fischer 344 rats (five per sex, 9-10 weeks old) were given a four hour exposure to benzocyclobutene vapors at concentration levels of 742, 1588 and 4203 ppm. The animals were placed into a 112 liter glass and stainless steel Rochester-type chamber under dynamic airflow conditions. The chamber airflow was maintained at a rate of 30 liters/minute. The rats were weighed and observed prior to the test, observed during the exposure and daily thereafter for two weeks, and weighed periodically throughout the two week period. All rats at the 742 ppm level and 9 out of 10 rats at the 1588 ppm level appeared normal throughout the post-exposure period; none of the animals at these two levels died. All 10 rats at the 4203 ppm level died during or within two days of the exposure. The LC50 was determined to be 2583 ppm (11124 mg/m^3), calculated by non-linear interpolation between 1588 and 4203 ppm, as described by Stephan (1977).

ITSL was calculated according to Rule 232(1)(f) as follows:

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

$$\text{ITSL} = (11124 \text{ mg}/\text{m}^3)/50000$$

$$\text{ITSL} = (11124 \text{ mg}/\text{m}^3)/50000 \times 1000 \mu\text{g}/\text{mg}$$

$$\text{ITSL} = 220 \mu\text{g}/\text{m}^3 \text{ (rounded to 2 significant figures)}$$

According to Rule 232(2)(c), the averaging time is annual.

References

Dow Chemical (1991). Personal communication with Gary Butterfield, Michigan Department of Natural Resources (MDNR); department renamed Michigan Department of Environmental Quality (MDEQ). Air Quality Division, Toxics Unit.

Stephan, C. E. (1977). Methods for Calculating an LC50 Aquatic Toxicology and Hazard Evaluation. ASTM 634, F. L. Mayer and J. L. Hamelink, Eds., American Society for Testing and Materials, pp. 65-84.