

**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY**

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**INTEROFFICE COMMUNICATION**

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TO: File for Anthracene [CAS# 120-12-7]  
FROM: Doreen Lehner, Toxics Unit, Air Quality Division  
DATE: February 7, 2017  
SUBJECT: Anthracene [CAS# 120-12-7] ITSL change in the averaging time from 24 hours to annual

The initial threshold screening level (ITSL) for anthracene is 1000  $\mu\text{g}/\text{m}^3$  based on an annual averaging time. The ITSL was originally established on 5/26/1993 and was based on an EPA oral reference dose (RfD) of 0.3 mg/kg/day based on a 90 day gavage study in male and female mice (EPA, 1989). There were no critical effects seen for anthracene even at the highest dose administered. As the key study used to derive the ITSL is a 90 day gavage study, the averaging time is appropriately set at annual. Therefore, the averaging time is being changed from 24 hours to annual.

References:

Act 451 of 1994, Natural Resources and Environmental Protection Act and Air Pollution Control Rules, Michigan Department of Environmental Quality.

EPA. 1989. Subchronic toxicity in mice with anthracene. Final Report. Hazelton Laboratories America, Inc. Prepared for the Office of Solid Waste, Washington, DC.

MICHIGAN DEPARTMENT OF NATURAL RESOURCES

INTEROFFICE COMMUNICATION

May 26, 1993

TO: File for Anthracene, CAS No. 120-12-7

FROM: Dennis Bush, Surface Water Quality Division

SUBJECT: ITSL Derivation

Inhalation exposure to mixtures containing polyaromatic hydrocarbons has been associated with the development of cancer in humans (ATSDR, 1990). However, there is insufficient data available to classify anthracene as a human carcinogen. It is therefore, classified as a Class D carcinogen in IRIS (EPA, 1993).

The ITSL for anthracene is based on the RfD listed in IRIS (EPA, 1993) since no RfC is available. The RfD of 0.3 mg/kg/d was based on a subchronic study conducted by EPA (1989). In this study, male and female CD-1 mice were administered 0, 250, 500 and 1000 mg/kg/d anthracene via gavage for 90 days. The compound had no effect on body weight, food consumption, ophthalmology, hematology, clinical chemistry, organ weights, gross pathology, histopathology and survival. The dose of 1000 mg/kg/d was considered a NOAEL. An uncertainty factor of 3000 was used by EPA to derive the RfD. This uncertainty factor consisted of 10x for each interspecies, intraspecies and subchronic-to-chronic extrapolation. An additional 3x uncertainty factor was used because there were insufficient data on reproduction/development and there were also insufficient data in a second species.

No studies using the inhalation route of exposure were cited in the Toxicological Profile for Polycyclic Aromatic Hydrocarbons (ASTDR, 1990). A May 10, 1993 CAS-on-line literature search, covering the period since 1990, also failed to locate any inhalation toxicity studies. There were also no occupational exposure levels (OELS) available. Due to a lack of inhalation studies, there is no available information to suggest that it is inappropriate to base the ITSL on data from an oral route of exposure study. It was therefore considered appropriate to derive an ITSL using the RfD, as follows:

ITSL Derivation:

$$\text{ITSL} = \text{RfD} \times 70 \text{ kg}/20\text{m}^3$$

$$\text{ITSL} = 0.3 \text{ mg}/\text{kg}/\text{d} \times 70\text{kg}/20\text{m}^3 = 1.05 \text{ mg}/\text{m}^3$$

$$\text{ITSL} = 1.0 \text{ mg}/\text{m}^3 \text{ (the averaging time is 24 hours)}$$

REFERENCES

- ATSDR. 1990. Toxicological. Profile for Polycyclic Aromatic Hydrocarbons.
- EPA. 1989. Subchronic toxicity in mice with anthracene. Final report. Hazelton Laboratories America, Inc. As cited in IRIS 1993.
- EPA. 1993. Integrated Risk Information System (IRIS database). Chemical file for anthracene (120-12-7). Verification date 2/7/90.

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