

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

INTEROFFICE COMMUNICATION

TO: File for Acrylic Acid (CAS # 79-10-7)

FROM: Robert Sills, AQD Toxics Unit Supervisor

SUBJECT: Acrylic acid ITSL justification

DATE: October 30, 2015

The current ITSL for acrylic acid (1 ug/m^3) was originally established on 4/1/94. 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, based on the nature and duration of the key study and the ITSL value derivation, as allowed under Rule 229(2)(b). Therefore, the AT is being changed from 24 hours to annual at this time, and the ITSL value remains 1 ug/m^3 .

The ITSL is consistent with the EPA (1995) RfC. However, the IRIS database currently does not have a file for acrylic acid. IRIS does have a note that acrylic acid is under a "literature screening review" (but no tox review / support document is available), and that the last significant revision was on 4/1/94. The available hard-copy IRIS file retained by AQD provides an RfC = 1 ug/m^3 with a revision date of 5/1/95.

The ITSL, and the EPA (1995) RfC, is based on a mouse subchronic inhalation study (Miller et al., 1981) and the critical effect of degeneration of the nasal olfactory epithelium. Groups of rats and mice were exposed 6 hrs/d, 5 ds/wk for 13 weeks to 0, 14.9, 74.7, or 224 mg/m^3 . A NOAEL was not established in mice; the LOAEL was 14.94 mg/m^3 . The mouse LOAEL(ADJ) = 2.67 mg/m^3 , and the LOAEL(HEC) = 0.33 mg/m^3 (330 ug/m^3). The severity as well as the incidence increased with exposure concentration in mice. Rats first demonstrated lesions of the nasal olfactory epithelium at 75 ppm (224 mg/m^3); the rat NOAEL was 25 ppm (74.7 mg/m^3).

In deriving the RfC, EPA (1995) applied a total UF = 300 and a MF = 1. The total UF consisted of 10 to protect sensitive individuals, 3 for extrapolation from subchronic to chronic, and 10 to account for both interspecies extrapolation (because dosimetric adjustments were applied) and use of a LOAEL because the effect was considered mild.

$$\text{ITSL} = \text{RfC} = \text{LOAEL(HEC)}/\text{UF}_T = 330 \text{ ug/m}^3 / 300 \sim 1 \text{ ug/m}^3.$$

References

EPA. 1995. Integrated Risk Information System (IRIS database). File for acrylic acid. RfC last revised 5/1/95. Hard copy only available in AQD Toxics Unit files. Not currently available on the EPA IRIS online database, as of 10/30/15.

Miller, R.R., et al. 1981. Inhalation toxicity of acrylic acid. *Fund. Appl. Toxicol.* 1(3): 271-277. As cited in EPA (1995).