MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

INTEROFFICE COMMUNICATION

July 9, 2001

TO: File for 2-ethylhexyl acrylate (103-11-7)

FROM: Marco Bianchi

SUBJECT: Initial Threshold Screening Level

The initial threshold screening level (ITSL) for 2-ethylhexyl acrylate is 18 µg/m^3 based on an annual averaging time.

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.

A complete reference check was conducted for 2-ethylhexyl acrylate, but only one study was available for review. In an acute range-finding toxicity study by Smyth et al. (1951), Sherman rats were exposed orally or by inhalation to 2-ethylhexyl acrylate. In the oral portion of the study, groups of 6 male or female rats were given a single dose in a logarithmic series by gastric intubation. The animals were observed for 14 days, and the LD_{50} value was obtained graphically. The LD_{50} for 2-ethylhexyl acrylate was determined to be 5.66 g/kg. In the inhalation portion of the study, 6 male or female rats were exposed to a virtually saturated concentration of 2-ethylhexyl acrylate. This virtually saturated vapor concentration equaled 99.5 mg/m^3 and resulted in no deaths of test animals after 8 hours of exposure. Although there were no deaths in this study, past practices have allowed a non-mortality based concentration to be used as a surrogate LC_{50}. While it appears that the LC_{50} is the most appropriate to use, the ITSL derived from the LC_{50} resulted in a value that was more restrictive than one derived from an LD_{50}. It would not make sense to use incomplete LC_{50} mortality data resulting in a lower ITSL when complete LD_{50} mortality data is available. Therefore, the ITSL will be based on the LD_{50} of 5.66g/kg.

The ITSL was derived as follows:

LD_{50} = 5.66 g/kg

LD_{50} = 5.66 g/kg = 5660 mg/kg

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$$\text{ITSL} = \frac{1}{500} \times \frac{1}{40} \times \frac{1}{100} \times \frac{5660}{0.167 \times 0.945} = 0.0179 \text{ mg/m}^3$$

0.0179 mg/m^3 x 1000 = 17.9 µg/m^3 based on annual averaging.

The ITSL for 2-ethylhexyl acrylate = 18 µg/m^3 based on annual averaging.

References:

Smyth, HF. el. al., 1948. Further Experience with the Range-Finding Toxicity Test in the Industrial Toxicology Laboratory. Journal of Industrial Hygiene and Toxicology. 30:63-68.

Smyth, HF. el. al., 1951. Range-Finding Toxicity Data: List IV. Archives of Industrial Hygiene and Occupational Medicine. 30:(4)119-122.

MB:DB
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