MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
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INTEROFFICE COMMUNICATION
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TO: Polydimethyl diallyl ammonium chloride file (CAS # 26062-79-3)

FROM: Keisha Williams, Air Quality Division, Toxics Unit

SUBJECT: Screening level update for polydimethyl diallyl ammonium chloride

DATE: October 12, 2016

The initial threshold screening level (ITSL) for polydimethyl diallyl ammonium chloride is 1000 $\mu g/m^3$ (annual averaging time) based on the Michigan Department of Environmental Quality (MDEQ), Air Quality Division (AQD) Rule 336.1229 (2) (b) and 336.1232 (1) (a). The ITSL was originally established with an averaging time set at 24 hours. It is being changed at this time to annual, as allowed per Rule 229 (2), because the original derivation accounted for chronic exposure. Attached is the August 26, 1999 memo describing the derivation of the ITSL value.

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

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August 26, 1999

TO: Polydimethyl diallyl ammonium chloride file (CAS # 26062-79-3)

FROM: Gary Butterfield

SUBJECT: Screening level for polydimethyl diallyl ammonium chloride

A June 9, 1999, CAS and NLM on-literature search was conducted for polydimethyl diallyl ammonium chloride. The NLM search found an oral 6-month toxicity study in rats that had been submitted to EPA unpublished. No other toxicity data was located from the literature searches.

In a six-month diet study, groups of 20 male and 20 female Sprague-Dawley rats were fed diets containing polydimethyl diallyl ammonium chloride at exposure levels of 0, 1000 or 2000 mg/kg body weight (Pharmocopathics Research Labs, 1977). The body weights of both exposed groups were statistically significantly less than controls. Therefore, the lowest dose level of 1000 mg/kg is considered to be a LOAEL. Assuming (due to a lack of available data) that inhalation of polydimethyl diallyl ammonium chloride does not cause any route of exposure specific problems that aren't also seen following oral consumption, it is possible to use the oral study to derive the screening level based upon this oral study LOAEL.

The ITSL can be determined from EPA's method for calculating an RfD, which can then be converted to the ITSL.

$$RfD = \frac{1000\,\frac{mg}{kg}}{10\ x\ 10\ x\ 3}\ x\ \frac{1}{10} = 300\,\frac{\mu g}{kg}$$

Where the following uncertainty factors were used. A factor of 10 was used for converting the LOAEL to NOAEL. A factor of 10 was used for both sensitive individuals and rat to human. A factor of 3 was used for study duration adjusting 6 months to chronic.

$$ITSL = RfD\ x\ \frac{70kg}{20\ m^3} = 300\ x\ \frac{70}{20} = 1000\,\frac{\mu g}{m^3}, 24-hour\ average$$

References:
Pharmocopathics Research Labs. 1977. Polydially dimethyl ammonium chloride: six month feeding study in rats. EPNOTS doc # 88-920002746.

GB:LF