MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

INTEROFFICE COMMUNICATION

TO: Dimethylisopropylamine file (CAS No. 996-35-0)

FROM: Gary Butterfield

DATE: February 8, 2010

SUBJECT: Screening level for Dimethylisopropylamine

The 2002 ITSL for dimethylisopropylamine of 0.1 µg/m³ annual average (default because of a lack of data) was requested to be reviewed to see if a greater screening level could be derived. Dimethylisopropylamine is a liquid with a melting point of -70℃, a boiling point of 66℃, and a vapor pressure of 10 3 mmHg at 20℃. The molecular formula is C5H13N with a molecular weight of 87 g/mol. The conversion from ppm to mg/m³ is 1 ppm = 3.56 mg/m³.

The following references or databases were searched to identify data to determine the screening level: U.S. Environmental Protection Agency (EPA) Integrated Risk Information System (IRIS), National Institute for Occupational Safety and Health (NIOSH) Registry for Toxic Effects of Chemical Substances (RTECS), American Conference of Governmental and Industrial Hygienists (ACGIH) Threshold Limit Values (TLVs), Michigan Department of Environmental Quality (DEQ) library, International Agency for Research on Cancer (IARC) Monographs, Chemical Abstract Service (CAS) Online (1968 - Feb 2010), National Library of Medicine (NLM) - Toxline, and National Toxicology Program (NTP) Status Report.

The CAS and NLM on-line literature searches were conducted on Feb. 1, 2010. There were no toxicity studies located upon which the ITSL can be based, as was the case in 2002. However, the MSDS for this chemical has a rat Lethal Concentration 50% (LC50) value of 2500 ppm listed, as well as Lethal Dose 50% (LD50) for oral and dermal exposure. The manufacturer, (Arkema, Inc., which used to be Atofina), was contacted to try and obtain a copy of the study report. The study was not available (still in Europe) to be shared outside of the company. However, the high production volume robust summary was available and obtained. This summary gives enough details to ensure a valid acute inhalation study was conducted for not only rats but for mice as well.

The 4-hour Wistar rat LC50 was reported to be 2550 ppm (or 9074 mg/m³) for both males and females. The 4-hour LC50 for male NMRI mice was reported to be 2250 ppm (or 8010 mg/m³), and in female NMRI mice 2400 ppm (or 8544 mg/m³).

From these three LC50s, possible ITSLs can be calculated under R232(1)(f) as follows.

Rat ITSL = (9074 mg/m^3)/(500x100) = 180 µg/m^3 annual
Male mice ITSL = (8010 mg/m^3)/(500x100) = 160 µg/m^3 annual
Female mice ITSL = (8544 mg/m^3)/ 500x100) = 170 µg/m^3 annual

All three of the above potential ITSLs, when rounded to one significant figure, result in the same final ITSL, which is being set at 200 µg/m^3 with an annual average.

References:

Arkema. 2004. HPV Robust Summary for dimethylisopropylamine (DMIPA). Maintained as electronic filename: 996350_DMIPA robust study summary.pdf

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