MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

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INTEROFFICE COMMUNICATION

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April 23, 2014

TO: File for Methylamine Hydrochloride (CAS No. 593-51-1)

FROM: Michael Depa, Toxics Unit, Air Quality Division

SUBJECT: Development of the Screening Level

The initial threshold screening level (ITSL) for methylamine hydrochloride is 140 µg/m³ with an 8-hr averaging time.

The following references or databases were searched to identify data to determine the screening level: Environmental Protection Agency's (EPA's) Integrated Risk Information System (IRIS), the Registry of Toxic Effects of Chemical Substances (RTECS), the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLV), National Institute of Occupational Safety and Health (NIOSH) Pocket Guide to Hazardous Chemicals, Environmental Protection Bureau Library, International Agency for Research on Cancer (IARC) Monographs, Chemical Abstract Service (CAS) Online (1967- May 2001), National Library of Medicine (NLM), Health Effects Assessment Summary Tables (HEAST), and National Toxicology Program (NTP) Status Report. The EPA has not established a reference concentration (RfC) or reference dose (RfD) for methylamine hydrochloride. The ACGIH and NIOSH have not established Occupational Exposure Limits (OELs). The melting point is 232-234ºC. The boiling point is 225-230 ºC @ 15mmHg. Its physical state is white crystalline. methylamine hydrochloride is hygroscopic. The molecular weight is 67.52 g. The molecular structure is pictured in Figure 1.

Figure 1. Molecular Structure of Methylamine Hydrochloride
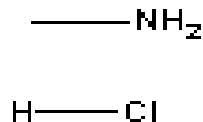
The ACGIH (1991) set a TLV for methylamine (CAS No. 74-89-5) in 1992 at 5 ppm (6.35 mg/m³, based on molecular weight of 31.06g). The effects of methylamine and methylamine hydrochloride are expected to be similar (respiratory effects); therefore, the TLV for methylamine was deemed appropriate to use to derive a screening level for methylamine hydrochloride. The TLV was adjusted based on molecular weight as follows:

TLV for methylamine hydrochloride

$$= \text{TLV for methylamine x } \frac{\text{Molecular Weight of Methylamine hydrochloride}}{\text{Molecular Weight of Methylamine}}$$

$$\text{TLV for methylamine hydrochloride} = 6.35 \text{ mg/m}^3 \text{ x } \frac{67.52\text{g}}{31.06\text{g}}$$

$$\text{TLV for methylamine hydrochloride} = 6.35 \text{ mg/m}^3 \text{ x } 2.17 = 13.779 \text{ mg/m}^3$$

$$\text{TLV for methylamine hydrochloride} = 14 \text{ mg/m}^3$$

Pursuant to Rule 232(1)(c), the ITSL is equal to the occupational exposure limit divided by 100.

$$\text{ITSL} = \frac{14 \text{ mg/m}^3}{100} = 0.14 \text{ mg/m}^3$$

$$\text{ITSL} = 0.14 \frac{\text{mg}}{\text{m}^3} \times \frac{1000 \text{ µg}}{\text{mg}} = 140 \text{ µg/m}^3$$

Pursuant to Rule 232(2)(a), the averaging time is 8-hours.

Reference
ACGIH. 1991. American Conference of Governmental Industrial Hygienists (ACGIH) Documentation of the threshold limit values and biological exposure indices. Cincinnati, OH.