

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

INTEROFFICE COMMUNICATION

September 29, 2003

TO: 2-amino-3-chlorobenzoic acid methyl ester file (CAS # 77820-58-7)

FROM: Gary Butterfield, Toxics Unit, Air Quality Evaluation Section
Air Quality Division

SUBJECT: Screening level for 2-amino-3-chlorobenzoic acid methyl ester

2-Amino-3-chlorobenzoic acid methyl ester is also known 3-chloroanthranilic acid methyl ester or 3-CMA. This material is a light tan solid. The melting point is 45C. The boiling point is 144C. The vapor pressure at 25c is 0.0055 mmHg.

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 - May 2003), National Library of Medicine (NLM) - Toxline, and National Toxicology Program (NTP) Status Report.

The CAS and NLM on-line literature searches were conducted on May 5, 2003. No toxicity studies were located during the literature searches. Dow Chemical was able to provide summaries of an acute oral study and an acute inhalation study with 2-amino-3-chlorobenzoic acid methyl ester.

In the oral study, Dow/Gilbert (1994), groups of three male F344 rats were administered a gavage dose of 2000 mg/kg. No deaths occurred during the 14 day observation period. The LD50 is reported to be greater than 2,000 mg/kg.

In the inhalation study, Dow/Beekman (1994), groups of five male and five female F344 rats, 8 weeks old, were exposed to the maximum vapor concentration achievable - 2.5 ppm or 19 mg/m³ - for 4 hours. No deaths occurred during the 2 week observation period. The four hour LC50 is reported to be greater than 2.5 ppm.

It is generally preferred to use inhalation data when setting the screening level, over using oral data. However, in this case the maximum airborne concentration used in the inhalation study was not very large and would result in a very small ITSL (0.4 ug/m³) if it was used as the basis for the screening level. It is thought that the oral study value of 2000 mg/kg would result in a higher ITSL while still maintaining an extra degree of health protection because there were no deaths observed at that dose level, and the equation from R232(1)(h) is normally used with an LD50 value. The ITSL can be calculated as follows.

$$\text{ITSL} = \frac{2,000 \text{ mg/kg}}{500 \times 40 \times 100 \times 0.167} \times \frac{1 \text{ kg}}{0.9 \text{ m}^3} = 7 \text{ ug/m}^3 \text{ annual average}$$

The default rat inhalation rate of 0.9 m³/kg was used in the above calculation.

As a solid at ambient temperatures, 3-CMA would therefore be expected to be emitted to ambient air as a particulate. The contribution of airborne 3-CMA concentrations to ambient particulate levels should be considered when evaluating compliance with any of the NAAQS for particulate matter.

References:

Dow/Beekman. 1994. 2-amino-3-chlorobenzoic acid methyl ester (3-CMA): acute vapor inhalation toxicity study with Fischer 344 rats. Lab report code DR-0235-9991-002. Submitted to DEQ Air Quality by Dow Chemical.

Dow/Gilbert. 1994. 2-amino-3-chlorobenzoic acid methyl ester: acute toxicological properties. Lab report code DR-0235-9991-001. Submitted to DEQ Air Quality by Dow Chemical.