

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

INTEROFFICE COMMUNICATION

October 13, 2003

TO: Methane sulfonic acid file (CAS # 75-75-2)  
FROM: Gary Butterfield  
SUBJECT: Screening level for methane sulfonic acid

Methane sulfonic acid is a liquid with a molecular weight of 96.1 g/mol. Methane sulfonic acid is also commonly known as methylsulfonic acid. The melting point is -60 degrees Celsius. The boiling point is 200 degrees Celsius.

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. There were very few hits found during the literature searches for this chemical. The only toxicity data that could be used to set a screening level is an unpublished report by Carnegie-Mellon (1975) in EPA's TOSCA library (EPA OTS doc # 0536043).

In the unpublished report from Carnegie-Mellon (1975), an acute male Wistar rat oral LD50 of 0.281 ml/kg or 416 mg/kg was derived, in addition to the results of a 7-day dietary exposure study. The highest dose level in the 7-day diet study was 2000 mg/kg, with lower doses at 500, 200, 50 and 10 mg/kg. At all of the dose levels administered, the highest dose level included, did not produce any adverse effects in this study. It is quite possible that mixing the methane sulfonic acid with the diet allowed the diet to buffer some of the acid effects of methane sulfonic acid, which caused the acute LD50 to be such a lower dose value compared to the 7-day study. It is felt that the use of the lower LD50 to determine the ITSL would take into consideration some of the short-term acid effects of methane sulfonic acid. There is also some concern by this reviewer for the acid having a direct contact adverse effect on the respiratory tract tissue, for which the use of oral studies may not be appropriate at all. Due to a lack of any inhalation toxicity data being available, the oral LD50 is the best basis for setting the ITSL. The ITSL can be calculated from R232(1)(h) as follows.

$$\text{ITSL} = \frac{(416 \text{ mg/kg})}{500 \times 40 \times 100 \times 0.167} \times \frac{1 \text{ kg}}{0.9 \text{ m}^3} = 1.4 \text{ ug/m}^3 \text{ annual average}$$

The default rat inhalation rate of 0.9 m<sup>3</sup>/kg was used in the above calculation.

References:

Carnegie-Mellon Inst. 1975. Methane sulfonic acid and the potassium salt of MSA: results of acute per oral intubation & feeding the diets of rats for 7 days (PROJECT REPORT). EPA/OTS NTIS/OTS0536043