MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
_____

INTRROFFICE COMMUNICATION
_____

July 14, 2004

TO: 2-Hydroxyethyl methacrylate file (CAS # 868-77-9)

FROM: Gary Butterfield

SUBJECT: Initial Threshold Screening Level

2-Hydroxyethyl methacrylate is also known as HEMA or glycol methacrylate. It is a liquid. The melting point is -12C. The boiling point is 95C at 9 mmHg. The vapor pressure at 25C is 0.01 mmHg. The molecular weight is 130.1 g/mol. This material is a monomer used for hydrophilic polymer synthesis. It can also be used as a component of tissue embedding blocks used for tissue histopathology exams. 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 2004), 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 10, 2004. Not many toxicity articles were found from the searches. HEMA is an EPA High Production Volume (H PV) chemical. Hopefully, more toxicity information on HEMA will be available in the future through the HPV program. Several case studies report contact dermatitis developing in HEMA exposed individuals. These reports lead to some concern in establishing a screening level for the possible development of chemical sensitivity in some individuals. One of the few English toxicity studies is the acute oral LD50 in male ddY mice that is reported to be 45.2 mmol/kg, which converts to 5887 mg/kg, reported by Tanii and Hashimoto (1982). In this study, groups of 4 mice weighing 24 to 27g were given one of at least 4 dose levels. The LD50 was determined from the method described by Weil (1952).

The ITSL can be determined from the mouse LD50 from Tanii and Hashimoto using the equation from R232(1)(h) as follows.

ITSL = (5887 mg/kg)/(500x 40 x 100 x 0.167) x 1kg/1.7m^3 = 10 µg/m^3 annual average

The default mouse inhalation rate of 1.7 m^3/kg was used in the above calculation.

References:
Tanii and Hashimoto. 1982. Structure-toxicity relationship of acrylates and methacrytates. Toxicol Lett 11: 125-129.

GB:LH