

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

INTEROFFICE COMMUNICATION

July 14, 2004

TO: Ethyl 2-cyanoacrylate file (CAS # 7085-85-0)
FROM: Gary Butterfield
SUBJECT: Screening level for Ethyl 2-cyanoacrylate

Ethyl 2-cyanoacrylate is also known as super glue, 2-propenoic acid cyanoethyl ester, and ECA. It is a colorless liquid with a vapor pressure of less than 2 mmHg at 25C. The melting point is -22C. The boiling point is 55C. The molecular weight is 125.1 g/mol. This material is used as an adhesive in many industrial and home processes.

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. The overall toxicity database on ECA is considered to be poor. Even though there is considerable industrial and home use of this adhesive material and probably a significant number of human exposures occurring, from available sources, the association is not very complete between exposure levels to this material and the observed adverse health effects.

Several acute studies report the oral LD50 to be greater than 5 g/kg. However, those journals are not readily available. The occurrence of respiratory tract irritation following inhalation exposures, leads to the conclusion that oral exposure studies are not appropriate to use as the basis of the screening level.

In an unpublished submission to EPA's ToSCA program, Product Safety Labs conducted a one-hour inhalation study. One group of 5 male and 5 female Wistar rats were exposed to nebulizer generated atmosphere at a concentration of 21 mg/L. Seven of the 10 exposed rats died within the first 5 days following exposure. Only one exposure dose was conducted in this study, and an LC50 was not able to be identified.

The ACGIH TLV for ECA is 0.2 ppm or 1 mg/m³. The TLV is protective of eye and respiratory tract irritation that has been reported to occur by workers exposed at levels of 4 mg/m³ and higher.

The ITSL will be based on 1/100 of the TLV, and set at 10 ug/m³ with an 8-hour averaging time, under R232(1)(c).

References:

ACGIH. 1998. Documentation of TLV and BEIs - 1998 supplement.

Product Safety Labs. Acute inhalation study in rats using superbonder 420 ethyl cyanoacrylate. EPA OTS doc # 0513579.

WHO. 2001. Concise International Chemical Assessment Document # 36 - methylcyanoacrylate and ethyl cyanoacrylate.

GB:LH