

# MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

## INTEROFFICE COMMUNICATION

September 29, 2003

TO: 3-chloro-4-fluorobenzonitrile file (CAS # 117482-84-5)

FROM: Gary Butterfield

SUBJECT: Screening level for 3-chloro-4-fluorobenzonitrile

3-Chloro-4-fluorobenzonitrile is also known as 3,4-CFBN. It is a colorless solid, with a molecular weight of 155.56 g/mol.

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 information was located for this chemical during the literature searches. Dow Chemical was able to supply a summary on a couple of acute tests for this chemical, Dow/Gilbert (1995).

In the oral acute study, groups of three male F344 rats received gavage doses of 500 or 2,000 mg/kg. There was a 14 day observation period following the single dosing. One of the rats given 2,000 mg/kg died. There were no deaths observed in the 500 mg/kg dose group. An actual oral LD50 was not reported for this study.

The highest dose level that caused no deaths could be used as a surrogate LD50 for the purpose of calculating a screening level, because no statistically valid LD50 was determined from the above study. It is possible to calculate a health protective screening level by using the dose level of 500 mg/kg (which is most likely less than the actual LD50), as if it were an LD50 value in the equation from R232(1)(h), as follows.

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

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

As a solid at ambient temperatures, 3,4-CFBN would therefore be expected to be emitted to ambient air as a particulate. The contribution of airborne 3,4-CFBN concentrations to ambient particulate levels should be considered when evaluating compliance with any of the NAAQS for particulate matter.

### References:

Dow/Gilbert. 1995. 3-Chloro-4-fluorobenzonitrile: acute toxicological properties. TERC report code DR-0319-4465-001. Summary provided by Dow Chemical for DEQ Air Quality Division.