

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

INTEROFFICE COMMUNICATION

March 13, 2004

TO: File for Vinyl Benzyl Chloride (CAS # 30030-25-2)
FROM: Maggie Sadoff
SUBJECT: Update Literature Search for Studies on Carcinogenicity

This chemical was last reviewed in 1996, at which time, an ITSL of **2 ug/m³** was set based on an unpublished study by DOW.

A search of the literature and the following databases was performed for information regarding vinyl benzyl chloride: American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values, National Institute for Occupational Safety and Health (NIOSH) Pocket Guide to Hazardous Chemicals, Integrated Risk Information System (IRIS), NIOSH's Registry of Toxic Effects of Chemical Substances (RTECS), Environmental Protection Bureau Library, International Agency for Research on Cancer (IARC) Monographs, CAS Online (1967 to December 2003), Hazardous Substance Data Bank (HSDB), National Library of Medicine/Toxline, Health Effects Assessment Summary Tables (HEAST), and National Toxicology Program (NTP) Study Database.

One study was found in CAS online, but only the abstract was available. The USAF (Rampy et al., 1977) conducted a long term inhalation toxicity and carcinogenicity study of vinyl benzyl chloride in rats and mice (number, sex and age unspecified). Animals were exposed to either 0.1 or 1.0 ppm vinyl benzyl chloride for a duration of 6 months, 5 days/wk, 6 hrs/day and then observed for the remainder of the lifespan. The only adverse effects noted for both exposure groups were reversible eye and nasal irritation during the exposures. No increases in frequency of any tumor type were observed in animals exposed to either concentration. Use of a control group was not reported in the abstract. Increased susceptibility to urinary tract and respiratory infections were attributed to stress from animal housing and pulmonary irritation.

Based on this limited information, the previously established ITSL based on the acute oral study by DOW stands. In the DOW study, three male rats per exposure group were given a 2% solution in corn oil of vinyl benzyl chloride at the following doses: 316 mg/kg, 630 mg/kg, 1260 mg/kg, 2520 mg/kg, and 5000 mg/kg. All rats in the 1260 mg/kg died within 24 hours. All rats in the 2520 mg/kg died within 36 hours. All rats in the 5000 mg/kg group died within 6 hours. All rats in the 316 and 630 mg/kg groups survived. The study summary does not indicate over what time period the surviving animals were observed for acute toxicity. DOW concluded that the LD50 in male rats was between 630 and 1260 mg/kg in this study. A surrogate LD50 of 630 mg/kg was used to derive an ITSL of 2 ug/m³ in 1996.

Both studies lack important details, which make it difficult to determine which is better for the purpose of deriving a screening level. Information regarding animal age, animal weight, study duration, or use of a control group is either not available or incomplete for both studies.

Therefore, it was deemed appropriate to keep the ITSL based on DOW's acute oral study even though the USAF study was a long-term inhalation study for the following reasons:

1. The sex and number of animals per exposure group in the USAF study is unknown.
2. Endpoints assessed other than carcinogenicity and irritation in the USAF study are unknown.
3. Only two exposure groups were utilized in the USAF study.

A screening level for carcinogenicity of this compound was unable to be developed at this time. Although vinyl chloride is a Group 1 (sufficient evidence in humans and animals) carcinogen and benzyl chloride is a Group 2A (sufficient evidence in experimental animals) carcinogen by IARC classification, there is no data on the carcinogenicity of vinyl benzyl chloride.

Reference: Rampy LW, Leong BKJ, Jersey GC, Quast JF, Kalnins RV, Keyes DG and Kociba RJ. A long-term inhalation toxicity and carcinogenicity study of vinyl benzyl chloride in rats and mice. (1977; AMRL-TR-77-97, Proc Annu Conf Environ Toxicol, 8th; AD-A051 334, 211-31.

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