**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY**

INTEROFFICE COMMUNICATION

August 11, 2015

TO: 1-Vinylimidazole File (CAS No. 1072-63-5)

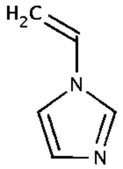
FROM: Mike Depa

SUBJECT: Derivation of Initial Threshold Screening Level (ITSL)

The ITSL for 1-vinylimidazole is 180 µg/m³ with a 24-hr averaging time.

A previous literature search by Air Quality Division for a screening level derivation (dated 5/4/1989) discovered only a reference to an lethal dose 50% (LD50) of 1100 mg/kg, but not documentation concerning the study details.

Formula: C5H6N2;
Molecular Weight: 94.05g




A current reference check was done to find toxicity studies: 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, National Library of Medicine (NLM) - Toxline, and National Toxicology Program (NTP) Status Report. The Chemical Abstract Service (CAS) Online was not checked.

The only repeated-dose study found that was adequate to derive a screening level was a reproductive/developmental toxicology study (BASF, 2012). The following summary describes this 14-day study:

> BASF Corporation is submitting results of a Combined Repeated Dose Toxicity Study with the Reproduction/Developmental Toxicity Screening Test in Wistar Rats [Crl:WI(HAN) Charles River, Sulzfeld, Germany], administration via gavage, according to OECD Guideline 422, with 1-Vinylimidazol (CAS No. 1072-63-5), conducted by BASF SE, Ludwigshafen, Germany. The test substance is a monomer.
>
> The test substance was administered to groups of 10 male and 10 female young Wistar rats (F0 parental generation) dissolved in drinking water, via daily gavage. The dose levels were 0, 5, 15 and 35 mg/kg body weight/day. About 2 weeks after the beginning of treatment, F0 animals were mated to produce a litter (F1). Mating pairs were from the same dose group. Pregnant females were allowed to give birth and the offspring was brought up until postnatal day (PND) 4. The study was terminated with the sacrifice of the F1 young adult animals on PND 4 and of lactating dams shortly thereafter.

The mid- and high-dose parental female animals (15 and 35 mg/kg/day) showed piloerection, semiclosed eyelids as well as reduced food consumption and body weight gain during the premating, gestation and lactation phases of the study.

Peri-postnatal survival of the mid- and high-dose offspring (15 and 35 mg/kg/day) was affected: the number of live-born pups and the live birth index was reduced (94 and 74%, respectively). Pups from these groups also had increased mortality rates as well as reduced body weights and body weight gains. In the high-dose group this included a complete loss of 2 litters. No test substance-related adverse reproductive/ developmental findings were noted at 5 mg/kg.

The 94 offspring in the high-dose group (35 mg/kg/d) had an increased incidence of vascular defects including 10 cases of dilated aortic arch and aorta. Four cases of these changes were still noted at 15 mg/kg/day (in a total of 106 pups). At 5 mg/kg no such findings were observed.

A subchronic RfD can be derived from this study using the no-observed-adverse-effect-level (NOAEL) of 5 mg/kg/day dose as follows:

$$RfD = \frac{NOAEL}{UF_1 \times UF_2}$$

Where $UF_1$ and $UF_2$ are uncertainty factors of 10 each for interspecies and intraspecies extrapolation.

$$RfD = \frac{5\ mg/kg}{10 \times 10}$$

$$RfD = 0.05\ mg/kg$$

An ITSL can be derived pursuant to Rule 232(1)(b):

$$ITSL = RfD \times 70kg/20m^3$$

$$ITSL = 0.05\ mg/kg \times 70kg/20m^3 \times 1000\ \mu g/mg$$

$$ITSL = 180\ \mu g/m^3 \text{ (rounded to 2 significant figures)}$$

The 2-week study duration was considered adequate for a reproductive/development study. No duration adjustment uncertainty factor is necessary. However, because of the short exposure period, a 24-hour averaging time was deemed appropriate, pursuant to Rule 229(2)(b).

Reference:

BASF. 2012. Letter to: United States Environmental Protection Agency dated: August 14, 2012. From BASF, Janet Cerra. Attn: TSCA Section 8(e). Room 6428. 1201 Constitution Avenue, NW. Washington, DC 20004. Subject: Notice in Accordance with TSCA Section 8(e): Results of a Combined Repeated Dose Toxicity Study with the Reproduction/ Developmental Toxicity Screening Test in Wistar Rats with 1-Vinylimidazol (CAS No. 1072-63-5). 8EHQ-12-18782, 88120000325, Received 8/15/12.