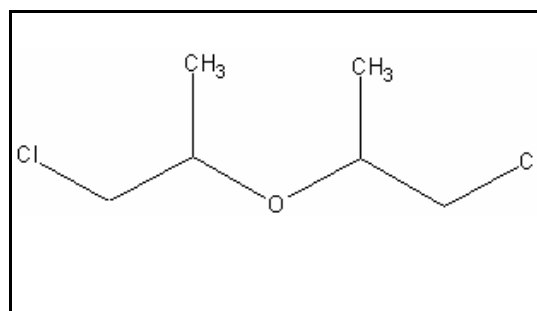




TIER I HUMAN HEALTH NONCANCER CRITERIA

BIS(2-CHLOROISOPROPYL) ETHER

CAS RN: 108-60-1
Water Solubility: 1700 mg/L
Log K_{ow} : 1.61^P
Reference Dose: 0.0358 mg/kg/day
Carcinogenicity Weight-of-Evidence Classification:



Standard

The human health noncancer bis(2-chloroisopropyl) ether criterion for drinking water sources is 990 µg/L. The human health noncancer criterion for nondrinking water sources is 48,000 µg/L.

Calculations

Bioaccumulation Factor:

BAF predicted based on Log K_{ow} (from Stephan 1993)
Log K_{ow} = 1.61 (CLOGP program), K_{ow} = 40.738
Trophic level 3 FCM = 1.0; trophic level 4 FCM = 1.0

$$f_{fd} = 1 / (1 + (0.00000024 \text{ kg/L})(K_{ow})) = 1.0$$

$$\text{Baseline BAF}_{T3} = (\text{FCM})(K_{ow}) = (1.0)(40.738) = 40.738$$

$$\text{Baseline BAF}_{T4} = (1.0)(40.738) = 40.738$$

$$\text{Human health BAF}_{T3} = [(40.738)(0.0182)+1](1.0) = 1.7414$$

$$\text{Human health BAF}_{T4} = [(40.738)(0.0310)+1](1.0) = 2.2629$$

Acceptable Daily Exposure:

From the IRIS database:

Critical Effect: decreased growth rate, food consumption, and organ weights

$$\text{ADE} = \frac{\text{NOAEL}}{\text{UF}} = \frac{35.8 \text{ mg/kg-day}}{1000} = 0.0358 \text{ mg/kg/d}$$

Calculation of Criteria:

$$\begin{aligned} \text{Non Drinking Water HNC} &= [(0.0358)(70)(0.8)]/0.01 + [(0.0036)(1.7414) + (0.0114)(2.2629)] \\ &= \mathbf{48,000 \text{ } \mu\text{g/L}} \end{aligned}$$

$$\begin{aligned} \text{Drinking Water HNC} &= [(0.0358)(70)(0.8)]/2 + [(0.0036)(1.7414) + (0.0114)(2.2629)] \\ &= \mathbf{990 \text{ } \mu\text{g/L}} \end{aligned}$$

References

1. Stephen, C.E. 1993. Derivation of Proposed Human Health and Wildlife Bioaccumulation Factors for the Great Lakes Initiative. Environmental Research Laboratory, Office of Research and Development, U.S. EPA, Duluth, MN.
2. USEPA 1990. Integrated Risk Information System (IRIS database) chemical file for bis(2-chloroisopropyl) ether (CAS # 108-60-1).
3. Leo, A. and D. Weininger 1997. Daylight Software CLogP Version 3.15+ for Unix Pomona Medical Chemistry Project, Pomona College, Claremont, CA. Distributed by Daylight Chemical Information Systems, Inc., 3952 Claremont St., Irving, CA 92714 (Reference for the Log K_{ow})

Acronyms

ADE	Acceptable Daily Exposure
BAF	Bioaccumulation Factor
CAS RN	Chemical Abstract Service Registry Number
FCM	Food Chain Multiplier
IRIS	Integrated Risk Information System
K _{ow}	Octanol-Water Partition Coefficient
LOAEL	Lowest observed adverse effect level
NOAEL	No observed adverse effect level
P (superscript)	Predicted value
RPLC	Reverse-phase Liquid Chromatography
UF	Uncertainty factor

Revision History

September 18, 1997 - Criteria first developed

March 31, 2000 – Criteria rechecked (no modifications). Fact sheet updated.

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