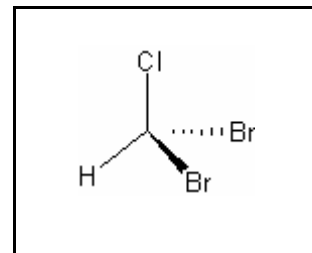




TIER I HUMAN HEALTH NONCANCER CRITERIA

CHLORODIBROMOMETHANE

CAS RN:	124-48-1
Water Solubility:	4000 mg/L
Log K_{ow} :	2.232 ^P
Reference Dose:	0.0214 mg/kg/day
Carcinogenicity Weight-of-Evidence Classification:	Class C; Possible human carcinogen



Standard

The human health noncancer chlorodibromomethane criterion for drinking water sources is 570 $\mu\text{g/L}$. The human health noncancer criterion for nondrinking water sources is 12,000 $\mu\text{g/L}$.

Calculations

Bioaccumulation Factor:

BAF predicted based on Log K_{ow} (from Stephan 1993)

$$\text{Log } K_{ow} = 2.232 \text{ (CLOGP)}, K_{ow} = 170.6$$

$$\text{Trophic level 3 FCM} = 1.005; \text{ trophic level 4 FCM} = 1.000$$

$$f_{fd} = 1/(1+(0.00000024 \text{ kg/L})(K_{ow})) = 1.00$$

$$\text{Baseline BAF}_{T3} = (\text{FCM})(K_{ow}) = (1.005)(170.6) = 171.5$$

$$\text{Baseline BAF}_{T4} = (1.000)(170.6) = 170.6$$

$$\text{Human health BAF}_{T3} = [(171.5)(0.0182)+1](1.00) = 4.120$$

$$\text{Human health BAF}_{T4} = [(170.6)(0.0310)+1](1.00) = 6.289$$

Acceptable Daily Exposure:

From the IRIS database:

Critical Effect: Hepatic lesions

$$\text{ADE} = \frac{\text{NOAEL}}{\text{UF}} = \frac{21.4 \text{ mg/kg-day}}{1000} = 0.0214 \text{ mg/kg/d}$$

Calculation of Criteria:

$$\begin{aligned} \text{Non Drinking Water HNC} &= [(0.0214)(70)(0.8)]/0.01+[(0.0036)(4.12)+(0.0114)(6.289)] \\ &= \mathbf{570 \mu\text{g/L}} \end{aligned}$$

$$\begin{aligned} \text{Drinking Water HNC} &= [(0.0214)(70)(0.8)]/2+[(0.0036)(4.12)+(0.0114)(6.289)] \\ &= \mathbf{12,000 \mu\text{g/L}} \end{aligned}$$

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 1996. Integrated Risk Information System (IRIS database) chemical file for chlorodibromomethane (124-48-1).
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

October 27, 1998 - Criteria first developed

April 11, 2000 – Fact sheet updated. No modifications made to criteria.

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