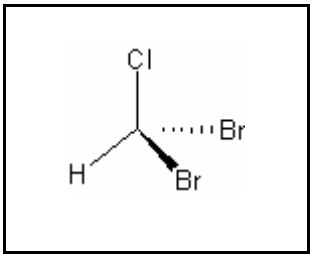
Indiana Department of Environmental Management
Office of Water - Water Quality Standards Section

TIER I HUMAN HEALTH CANCER CRITERIA

CHLORODIBROMOMETHANE

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



Standard

The human health cancer chlorodibromomethane criterion for drinking water sources is 4 µg/L.
The human health cancer criterion for nondrinking water sources is 86 µg/L.

Calculations

Bioaccumulation Factor:

BAF predicted based on Log K_{ow} (from Stephan 1993)
Log K_{ow} = 2.232 (CLOGP), K_{ow} = 170.6
Trophic level 3 FCM = 1.005; trophic level 4 FCM = 1.000

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

Baseline $BAF_{T3} = (FCM)(K_{ow}) = (1.005)(170.6) = 171.5$

Baseline $BAF_{T4} = (1.000)(170.6) = 170.6$

Human health $BAF_{T3} = [(171.5)(0.0182)+1](1.00) = 4.120$

Human health BAF_{T4} = [(170.6)(0.0310)+1](1.00) = 6.289

Risk Associated Dose:

From the IRIS database:

RAD = $0.00001/q1^*$ = 0.00001/ 0.084
= 0.000119 mg/kg/day

Where:

RAD = Risk Associated Dose (mg/kg/day)
$q1^*$ = Cancer Slope Factor

Calculation of Criteria:

Non Drinking Water HCC =[(0.000119)(70)]/0.01+[(0.0036)(4.12)+(0.0114)(6.289)]

= **4 μg/L**

Drinking Water HCC = [(0.000119)(70)]/2+[(0.0036)(4.12)+(0.0114)(6.289)]

= **86 μg/L**

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

April 11, 2000 – Criteria first developed

Contact Information

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