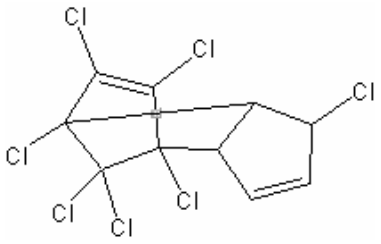
Indiana Department of Environmental Management
Office of Water - Water Quality Standards Section

TIER II HUMAN HEALTH NONCANCER VALUES

HEPTACHLOR

CAS RN:	76-44-8
Water Solubility:	0.18 mg/L
Log K_{ow}:	4.60^{P}
Reference Dose:	0.2 mg/kg/d
Carcinogenicity Weight-of-Evidence Classification:	Class B2; Probable human Carcinogen



Standard

The human health noncancer heptachlor value for drinking water sources is 0.29 µg/L. The human health noncancer value for nondrinking water sources is 0.29 µg/L.

Calculations

Bioaccumulation Factor:

BAF predicted based on Log K_{ow} and measured BCF (from Stephan 1993)
Log K_{ow} = 4.60 (CLOGP method), K_{ow} = 39,811, BCF = 1,469, Percent lipid = 0.01
Trophic level 3 FCM = 1.950; trophic level 4 FCM = 1.459

f_{fd} = 1/(1+(0.00000024 kg/L)(K_{ow})) = 0.9905

Baseline BAF_{T3} = (1.950)[(1,469/0.9905)-1](1/0.01) = 287,028

Baseline BAF_{T4} = (1.459)[(1,469/0.9905)-1](1/0.01) = 220,055

Human health BAF_{T3} = [(287,028)(0.0182)+1](0.9905) = 5,175

Human health BAF_{T4} = [(220,055)(0.0310)+1](0.9905) = 6,758

Acceptable Daily Exposure:

From the IRIS database:

Critical Effect: Red blood cell and liver effects

$$ADE = \frac{NOAEL}{UF} = \frac{200\ mg/kg\text{-}day}{1000} = 0.2\ mg/kg/d$$

Calculation of Criteria:

Non Drinking Water HNV =[(0.2)(70)(0.8)]/0.01+[(0.0036)(5175)+(0.0114)(6758)]

= **0.29 μg/L**

Drinking Water HNV = [(0.2)(70)(0.8)]/2+[(0.0036)(5175)+(0.0114)(6758)]

= **0.29 μg/L**

References

1. USEPA 1993. Integrated Risk Information System (IRIS database) chemical file heptachlor (76-44-8).

2. 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/Abbreviations

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
UF	Uncertainty factor

Revision History

September 18, 2000 - Values first developed.

Contact Information

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