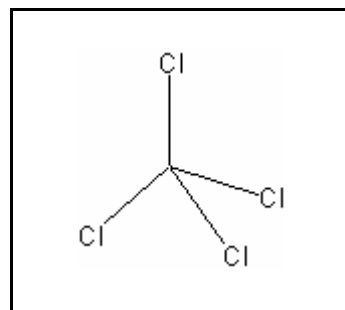




TIER I HUMAN HEALTH NONCANCER CRITERIA

CARBON TETRACHLORIDE

CAS RN:	56-23-5
Water Solubility:	805 mg/L
Log K_{ow} :	2.875 ^P
Reference Dose:	0.00071 mg/kg/day
Carcinogenicity Weight-of-Evidence Classification:	Class B2; Probable human Carcinogen



Standard

The human health noncancer carbon tetrachloride criterion for drinking water sources is 17 µg/L.
The human health noncancer criterion for nondrinking water sources is 120 µg/L.

Calculations

Bioaccumulation Factor:

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

Log K_{ow} = 2.875 (CLOGP program), K_{ow} = 749.89, BCF = 30, Percent lipid = 4.8

Trophic level 3 FCM = 1.028; trophic level 4 FCM = 1.007

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

$$\text{Baseline BAF}_{T3} = (1.028)[(30/1.0)-1](1/0.048) = 621.20$$

$$\text{Baseline BAF}_{T4} = (1.007)[(30/1.0)-1](1/0.048) = 608.5$$

$$\text{Human health BAF}_{T3} = [(0.0182)+1](1.0) = 12.30$$

$$\text{Human health BAF}_{T4} = [(0.0310)+1](1.0) = 19.86$$

Acceptable Daily Exposure:

From the IRIS database:

Critical Effect: Liver lesions

$$\text{ADE} = \frac{\text{NOAEL}}{\text{UF}} = \frac{0.71 \text{ mg/kg-day}}{1000} = 0.00071 \text{ mg/kg/d}$$

Calculation of Criteria:

$$\begin{aligned} \text{Non Drinking Water HCV} &= [(0.00071)(70)(0.8)]/0.01+[(0.0036)(12.30)+(0.0114)(19.86)] \\ &= 17 \mu\text{g/L} \end{aligned}$$

$$\begin{aligned} \text{Drinking Water HCV} &= [(0.00071)(70)(0.8)]/2+[(0.0036)(12.30)+(0.0114)(19.86)] \\ &= 120 \mu\text{g/L} \end{aligned}$$

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 1991. Integrated Risk Information System (IRIS database) chemical file for carbon tetrachloride (CAS # 56-23-5).
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
UF	Uncertainty factor

Revision History

April 11, 2000 – Criteria first developed

Contact Information

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