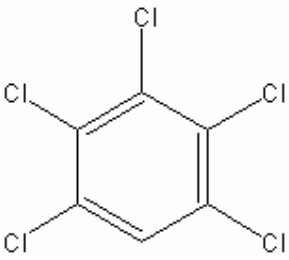
Indiana Department of Environmental Management
Office of Water - Wetlands, Water Quality and Sediments Section

TIER II ACUTE AND CHRONIC AQUATIC LIFE VALUES

PENTACHLOROBENZENE

CAS RN:	608-93-5
Water Solubility:	0.24 mg/L
Log K_{ow}:	5.106
Vapor Pressure:	8.21 x 10^{-4} mm of Hg^{P}
Environmental Partitioning @25 ^{0}C:	1.74% into $Water^{P}$
Hydrolysis Half-life:	hydrolysis unlikely



Standard

The procedures described in the Tier II methodology indicate that, except possibly where a locally important species is very sensitive, aquatic organisms should not be affected unacceptably if the four (4) day average concentration of pentachlorobenzene does not exceed 3.1 µg/L more than once every three (3) years on the average and if the one (1) hour average concentration does not exceed 16 µg/L more than once every three (3) years on the average.

Calculations

Acute Aquatic Life:

SAV = lowest GMAV/SAF

Lowest GMAV = 250 µg/L
SAF = 8.0

SAV = 250/8.0 = 31.25 µg/L

SMC = SAV/2 = 31.25/2 = **16 µg/L**

Chronic Aquatic Life:

SCC= SAV/SACR

SACR = 10.06 (geometric mean of 18, 18, and 3.143)

SCC = 31.25/10.06 = **3.1 μg/L**

Calculation of ACR's (from Oris et al. 1991):

Ceriodaphnia dubia

MATC = 350 μg/L

ACR = 1,100/350 = 3.143

Data

Table 1. Toxicity data used in the derivation of the acute and chronic aquatic life values.

Species	LC_{50}/EC_{50} (μg/L)	Duration (hr)	Test Type	Chemical Form	SMAV (μg/L)	GMAV (μg/L)	Reference Number	EVISTRA Score N, U, M
Bluegill Lepomis macrochirus	250	96	S,U	1,2,4,5-tetrachlro-benzene	2,000	2,000	1	
Rainbow Trout Oncorhynchus mykiss	710	96	FT,M	1,2,4,5-tetrachlro-benzene	710	710	2	
Cladoceran Ceriodaphnia dubia	1,100	48	S,U	1,2,4,5-tetrachlro-benzene	1,910	1,910	3	
Cladoceran Daphnia magna	5,300	48	S,U	1,2,4,5-tetrachlro-benzene	5,300	5,300	4	

References

1. Buccafusco,R.J., S.J.Ells, and G.A.LeBlanc 1981. Acute Toxicity of Priority Pollutants to Bluegill (Lepomis macrochirus). Bull. Environ. Contam. Toxicol. 26(4):446-452

2. Call,D.J., L.T.Brooke, N.Ahmad, and J.E.Richter 1983. Toxicity and Metabolism

Studies with EPA Priority Pollutants and Related Chemicals in Freshwater Organisms. EPA 600/3-83-095, U.S. EPA, Duluth, MN:120 p. (U.S. NTIS PB83-263665)

3. Oris,J.T., R.W.Winner, and M.V.Moore 1991. A Four-Day Survival and Reproduction Toxicity Test for Ceriodaphnia dubia Environ. Toxicol. Chem. 10(2):217-224.

Acronyms

CAS RN	Chemical Abstract Service Registry Number
K_{ow}	Octanol-Water Partition Coefficient
P (superscript)	Predicted value
SAV	Secondary Acute Value
GMAV	Genus Mean Acute Value
SAF	Secondary Acute Factor
SMC	Secondary Maximum Concentration
SCC	Secondary Continuous Concentration
SACR	Secondary Acute-Chronic Ratio
FT	Flow-thru
S	Static
U	Unmeasured
M	Measured
EVISTRA	Evaluation and Interpretation of Suitable Test Results in AQUIRE (EPA quality checking method/database)

Revision History

12/7/99 Values first developed

Contact Information

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