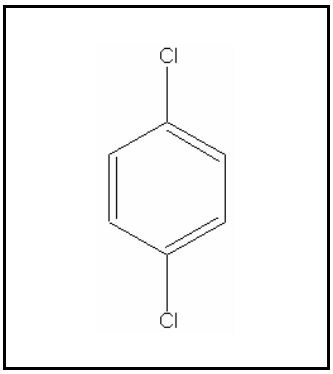
Indiana Department of Environmental Management
Office of Water - Water Quality Standards Section

TIER II ACUTE AND CHRONIC AQUATIC LIFE VALUES

1,4-DICHLOROBENZENE

CAS RN: 106-46-7
Water Solubility: 0.00813 g/100 mL
Log K_{ow}:



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 1,4-dichlorobenzene does not exceed 16 µg/L more than once every three (3) years on the average and if the one (1) hour average concentration does not exceed 80 µg/L more than once every three (3) years on the average.

Calculations

Acute Aquatic Life:

SAV = lowest GMAV/SAF

Lowest GMAV = 1,120 µg/L
SAF = 7.0

SAV = 1,120/7.0 = 160 µg/L

SMC = SAV/2 = 160/2 = **80 µg/L**

Chronic Aquatic Life:

SCV = SAV/SACR

SACR = 9.857 (Geometric mean of 18, 18, and 2.956)

SCV = 160/9.857 = **16 µg/L**

Calculation of ACR:

Fathead Minnow

MATC = 2,850 µg/L

ACR = 8,425/2,850 = 2.956

Data

Table 1. GMAVs and SMAVs for 1,4-dichlorobenzene

Genus Mean Acute Value (µg/L)	Species	Species Mean Acute Value (µg/L)	Acute-Chronic Ratio	Reference Number
4,300	Bluegill *Lepomis macrochirus*	4,300		1
11,681	Fathead Minnow *Pimephales promelas*	4,200		3
	Fathead Minnow *Pimephales promelas*	30,000		4
	Fathead Minnow *Pimephales promelas*	33,700		5
	Fathead Minnow *Pimephales promelas*	3,600		6
	Fathead Minnow *Pimephales promelas*	14,200		6
	Fathead Minnow *Pimephales promelas*	11,700		6

11,000	Cladoceran Daphnia magna	11,000	2
1,120	Rainbow Trout Oncorhynchus mykiss	1,120	7

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. 24(5): 446-452.

2. LeBlanc, G.A. 1980. Acute toxicity of priority pollutants to Daphnia magna. Bull. Environ. Contam. Toxicol. 24(5): 684-691.

3. Carlson,A.R. and P.A.Kosian 1987. Toxicity of Chlorinated Benzenes to Fathead Minnows (Pimephales promelas). Arch. Environ. Contam. Toxicol. 16(2):129-135

4. Curtis,M.W. and C.H.Ward 1981. Aquatic Toxicity of Forty Industrial Chemicals: Testing in Support of Hazardous Substance Spill Prevention Regulation. J. Hydrol. 51:359-367.

5. Curtis,M.W., T.L.Copeland, and C.H.Ward 1979. Acute Toxicity of 12 Industrial Chemicals to Freshwater and Saltwater Organisms. Water Res. 13(2):137-141

6. Mayes,M.A., H.C.Alexander, and D.C.Dill 1983. A Study to Assess the Influence of Age on the Response of Fathead Minnows in Static Acute Toxicity Tests Bull. Environ. Contam. Toxicol. 31(2):139-147.

7. 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.

Acronyms/Abbreviations

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-through
S	Static
U	Unmeasured
M	Measured
EVISTRA	Evaluation and Interpretation of Suitable Test Results in AQUIRE (EPA quality checking method/database)

Revision History

June 28, 1999 Values first developed
April 25, 2001 New search for data. No new studies added.

Contact Information

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