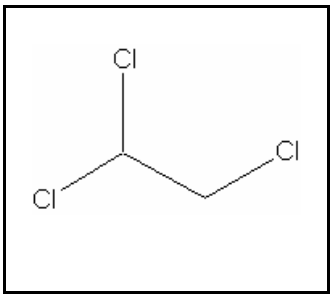
Indiana Department of Environmental Management
Office of Water - Water Quality Standards Section

TIER II ACUTE AND CHRONIC AQUATIC LIFE VALUES

1,1,2-TRICHLOROETHANE

CAS RN: 79-00-5
Water Solubility: 0.442 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 1,1,2-trichloroethane does not exceed 87 µg/L more than once every three (3) years on the average and if the one (1) hour average concentration does not exceed 490 µg/L more than once every three (3) years on the average.

Calculations

Acute Aquatic Life:

SAV = lowest GMAV/SAF

Lowest GMAV = 7,800 µg/L
SAF = 8.0

SAV = 7,800/8.0 = 975 µg/L

SMC = SAV/2 = 975/2 = **490 µg/L**

Chronic Aquatic Life:

SCV = SAV/SACR

SACR = 11.25 (Geometric mean of 18, 18, 4.4)

SCV = 975/11.25 = **87 µg/L**

Calculation of ACR's

Fathead Minnows

NOEC = 13,000 µg/L
LOEC = 26,000 µg/L

CV = Geometric Mean of 13,000 and 26,000 = 18,385

ACR = 81,000/18,385 = 4.4

Data

Table 1. GMAVs and SMAVs for 1,1,2-trichloroethane

Genus Mean Acute Value (µg/L)	Species	Species Mean Acute Value (µg/L)	Acute-Chronic Ratio	Reference Number
39,726	Cladoceran Daphnia magna	43,000		1
	Cladoceran Daphnia magna	18,000		4
	Cladoceran Daphnia magna	81,000	4.4	5
16,799	Fathead Minnow Pimephales promelas	81,800		2
	Fathead Minnow Pimephales promelas	81,700		6

	Fathead Minnow Pimephales promelas	81,600	7
7,800	Bluegill Lepomis macrochirus	40,000	3

References

References:

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2. Broderius, S., and M. Kahl 1985. Acute toxicity of organic chemical mixtures to the fathead minnow. Aquatic Toxicol. 6: 307-322.

3. Buccafusco, R.J., S.J. Ells, and G.S. LeBlanc 1981. Acute toxicity of priority pollutants to bluegill (Lepomis macrochirus). Bull. Environ. Contam. Toxicol. 26(4): 446-452.

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

5. Richter, J.E., S.F. Peterson, and C.F. Kleiner 1983. Acute and chronic toxicity of some chlorinated benzenes, chlorinated ethanes, and tetrachloroethylene to Daphnia magna. Arch. Environ. Contam. Toxicol. 12: 679-684.

6. Veith, G.D., D.J. Call, and L.T. Brooke 1983. Estimating the acute toxicity of narcotic industrial chemicals to fathead minnows. In: Aquatic Toxicology and Hazard Assessment: Sixth Symposium, ASTM STP 802, W.E. Bishop, R.D. Caldwell and B.B. Heidolph (Eds.). American Society for Testing and Materials, Philadelphia, PA.

7. Wallbridge, C.T., J.T. Fiandt, and G.L. Phipps 1983. Acute toxicity of ten chlorinated hydrocarbons to the fathead minnow (Pimephales promelas). Arch. Environ. Contam. Toxicol. 12: 661-666.

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

October 26, 1998 Values first developed
July 17, 2001 New search for data. No new studies added.

Contact Information

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