OHIO EPA SURFACE WATER QUALITY CRITERION FACT SHEET

Chemical Name: 1,1,2,2-Tetrachloroethane Developed by: Chris J. Skalski
CAS # 79-34-5 Data Retrieval Date: 10-29-97
Internal Code # 115 Fact Sheet Preparation Date: 3-01-06

ACUTE DATA

SPECIES	EC_{50}/LC_{50} (µg/l)	TEST TYPE[a]	DURATION (HOURS)	SMAV[b] (µg/l)	GMAV[b] (µg/l)	REFERENCE NUMBER
Cladoceran	9,300	S,U	48	14,625	14,625	1
Daphnia magna	23,000	S,M	48			2
	23,000[c]	S,M	48			3
	25,000[d]	S,M	48			2
	25,200[c]	S,M	48			3
	57,000[d]	S,M	48			2
	56,900[c]	S,M	48			3
	62,000[e]	S,M	48			2
	62,100[c]	S,M	48			3
Fathead Minnow	20,300	F,M	96	20,350	20,350	5
Pimephales promelas	20,400	F,M	96			6
	23,300[c]	F,M	96			4
Bluegill	21,000	S,U	96	21,000	21,000	7
Lepomis macrochirus						

[a] S = static; F = flow though; M = measured; U = unmeasured.
[b] SMAV = Species Mean Acute Value; GMAV = Genus Mean Acute Value.
[c] Duplicate data not used to calculate the SMAV.
[d] Data not used to calculate the SMAV since the test organisms were fed during testing.
[e] Data not used to calculate the SMAV since a corresponding EC50 was available from the same test.

CHRONIC DATA

SPECIES	CHRONIC VALUE (µg/l)	METHOD	SMCV[a] (µg/l)	GMCV[a] (µg/l)	REFERENCE NUMBER
Cladoceran *Daphnia magna*	6,900-14,000 9,829	Life Cycle	9,829	9,829	2
Cladoceran *Daphnia magna*	6,885-14,400[b] 9,957	Life Cycle			3
Fathead Minnow *Pimephales promelas*	1,400-4,000 2,366	Embryo-Larval	2,366	2,366	8

[a] SMCV = Species Mean Chronic Value; GMCV = Genus Mean Chronic Value.
[b] Duplicate data not used to calculate the SMCV.

REFERENCES

1. LeBlanc, G.A. 1980. Acute Toxicity of Priority Pollutants to Water Flea (*Daphnia magna*). Bull. Environ. Contam. Toxicol. 24(5):684-691.

2. 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(6):679-684.

3. 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.

4. Veith, G.D., D.J. Call and L.T. Brooke. 1983. Estimating the Acute Toxicity of Narcotic Industrial Chemicals to Fathead Minnows. In: W.E. Bishop, R.D. Cardwell and B.B. Heidolph (Eds.), Aquatic Toxicology and Hazard Assessment: Sixth Symposium, ASTM STP 802, Philadelphia, PA:90-97.

5. Geiger, D.L., C.E. Northcott, D.J. Call and L.T. Brooke. 1985. Acute Toxicities of Organic Chemicals to Fathead Minnows (*Pimephales promelas*), Vol. 2. Center for Lake Superior Environmental Studies, Univ. of Wisconsin, Superior, WI:326 p.

6. Walbridge, C.T., J.T. Fiandt, G.L. Phipps and G.W. Holcombe. 1983. Acute Toxicity of Ten Chlorinated Aliphatic Hydrocarbons to the Fathead Minnow (*Pimephales promelas*), Vol. 2. Center for Lake Superior Environmental Studies, Univ. of Wisconsin, Superior, WI:326 p.

7. 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.

8. U.S. EPA. 1980. Ambient Water Quality Criteria for Chlorinated Ethanes. EPA 440/5-80-029.

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CALCULATION OF ACUTE AQUATIC VALUE (AAV)[a]

Data Requirement OAC 3745-1-36(A)(1)	SPECIES	GMAV (µg/l)
(b)	Bluegill	21,000
(c)	Fathead Minnow	20,350
(d)	*Daphnia magna*	14,625

Secondary Acute Factor (SAF) = 8.0

Secondary Acute Value (SAV) = Lowest GMAV ÷ SAF
= 14,625 ÷ 8.0
= 1,828 = 1,800 µg/l

Tier II Acute Aquatic Value (AAV) = SAV ÷ 2
= 1,828 ÷ 2
= 914 = 910 µg/l

CALCULATION OF CHRONIC AQUATIC VALUE (CAV)[a]

Experimentally determined Acute-Chronic Ratios (ACRs):

SPECIES	ACUTE VALUE (µg/l)	CHRONIC VALUE (µg/l)	ACUTE-CHRONIC RATIO	SPECIES MEAN ACR
Cladoceran *Daphnia magna*	23,000	9,829	2.34	2.34
Fathead Minnow *Pimephales promelas*	20,300	2,366	8.58	8.58

Secondary Acute-Chronic Ratio (SACR) = $\sqrt[3]{(2.34)(8.58)(18)} = 7.12$

Chronic Aquatic Value (CAV) = SAV ÷ SACR
= 1,828 ÷ 7.12
= 257 = 260 µg/l

[a]See Ohio Administrative Code 3745-1-36 effective February 22, 2002.