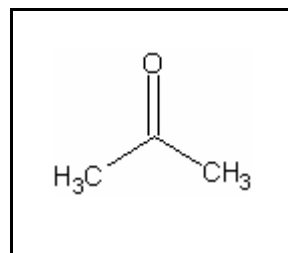




TIER I ACUTE AND TIER II CHRONIC AQUATIC LIFE VALUES

ACETONE

CAS RN: 67-64-1
Water Solubility: water soluble
Log K_{ow}: -0.24^P



Standard

The procedures described in the Tier I and Tier II methodologies 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 acetone does not exceed 1700 µg/L more than once every three (3) years on the average and if the one (1) hour average concentration does not exceed 15,000 µg/L more than once every three (3) years on the average.

Calculations

Acute Aquatic Life:

Four Lowest GMAVs:

Bluegill	100,000	µg/L
Brook Trout	100,000	µg/L
Amphipod	100,000	µg/L
Mussel	33,830	µg/L

$$S^2 = 20.60$$

$$S = 4.539$$

$$L = 2.400$$

$$A = 3.415$$

$$FAV = 30.41$$

$$CMC = FAV/2 = \mathbf{15,000 \mu g/L}$$

Chronic Aquatic Life:

$$SCC = FAV/SACR$$

$$SACR = 18$$

$$SCC = 30.41/18 = \mathbf{1,700 \mu g/L}$$

Data

Table 1. GMAVs and SMAVs for Acetone

<u>Genus Mean Acute Value ($\mu g/L$)</u>	<u>Species</u>	<u>Species Mean Acute Value ($\mu g/L$)</u>	<u>Acute- Chronic Ratio</u>	<u>Reference Number</u>
33,830	Mussel <u>Anodonta imbecilis</u>	33,830		1
>100,000	Amphipod <u>Gammarus fasciatus</u>	>100,000		2
>100,000	Snail <u>Helisoma</u>	>100,000		2
>100,000	Aquatic Sowbug <u>Asellus intermedius</u>	>100,000		2
>100,000	Planarian <u>Dugesia tigrina</u>	>100,000		2
>100,000	Annelid <u>Lumbriculus variegatus</u>	>100,000		2
5,315,235	Rainbow Trout <u>Oncorhynchus mykiss</u>	5,315,235		3

6,070,000	Brook Trout <u>Salvelinus fontinalis</u>	6,070,000	4
7,300,000	Bluegill <u>Lepomis macrochirus</u>	7,300,000	4
7,903,650	Fathead Minnow <u>Pimephales promelas</u>	7,903,650	4,5, 6, 7, 8
17,970,728	Daphnid <u>Daphnia magna</u>	17,970,728	9,10,11,12,13
46,900,000	Midge <u>Chironomous tentans</u>	46,900,000	11

References

1. Keller, A.E. 1993. Bull. Environ. Contam. Toxicol. 51(5): 696-702.
2. Ewell, W.S., J.W. Gorsuch, R.O. Kringle, K.A. Robillard, and R.C. Spiegel 1986. Environ. Toxicol. Chem. 5(9): 831-840.
3. Johnson, W.W., and M.T. Finley 1980. Resource Publication 137, Fish and Wildlife Service, U.S.D.I., Washington, D.C.:98 p.
4. Cardwell, R.D., D.G. Foreman, T.R. Payne, and D.J. Wilbur 1978. Acute and chronic toxicity of four organic chemicals to fish. U.S. EPA, Environmental Research Laboratory, Duluth, MN; Contract 68-01-0711 (Unpublished): 26 p.
5. Brooke, L.T., D.J. Call, D.L. Geiger, and C.E. Northcott 1984. Center for Lake Superior Environmental Studies, University of Wisconsin, Superior, Vol I, WI: 414 p.
6. Veith et al. 1983. ASTM STP 802, pp. 90-97.
7. Veith et al. 1983. Can. J. Fish. Aq. Sci. 40(6): 743-748.
8. Brungs, W.A. 1982. Toxic effects on fish of two dispersants used to introduce organic pesticides into water. Manuscript, U.S. EPA, ERL-Narragansett, R.I: 9 p.

9. Canton, J.H. and D.M.M. Adema 1978. *Hydrobiologia* 59(2): 135-140
10. Barera, Y. and W.J. Adams 1983. Resolving some practical questions about Daphnia acute toxicity tests. In: W.E. Bishop (ed.), *Aquatic Toxicity and Hazard Assessment*, 6th Symposium, ASTM STP 802, Philadelphia, PA: 509-518.
11. Ziegenfuss, P.S., W.J. Renaudette, and W.J. Adams 1986. Methodology for assessing the acute toxicity of chemicals sorbed to sediments: Testing the equilibrium partitioning theory. In: T.M. Poston and R. Purdy (eds.), *Aquatic Toxicology and Environmental Fate*, 9th Volume, ASTM STP 921, Philadelphia, PA: 479-493.
12. Deneer et al. 1988. *Aquatic Toxicol.* 12: 33-38.
13. LeBlanc, G.A. and D.C. Supernant 1983. The acute and chronic toxicity of acetone, dimethyl formamide, and triethylene glycol to Daphnia magna (Straus). *Arch. Environ. Contam. Toxicol.* 12(3): 305-310.

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

May 4, 1998 Values first developed
August 17, 2000 New search for data. No new studies added.

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