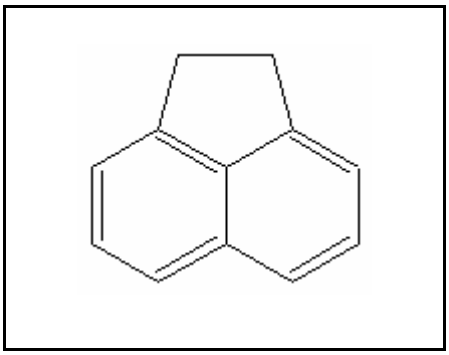
Indiana Department of Environmental Management
Office of Water - Water Quality Standards Section

TIER II ACUTE AND CHRONIC AQUATIC LIFE VALUES

ACENAPHTHENE

CAS RN: 83-32-9
Water Solubility: 3.47 mg/L
Log K_{ow}: 3.92



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 acenaphthene does not exceed 27 µg/L more than once every three (3) years on the average and if the one (1) hour average concentration does not exceed 140 µg/L more than once every three (3) years on the average.

Calculations

Acute Aquatic Life:

SAV = lowest GMAV/SAF

Lowest GMAV = 1664 µg/L
SAF = 6.1

SAV = 1664/6.1 = 272.8 µg/L

SMC = SAV/2 = 272.8/2 = **140 µg/L**

Chronic Aquatic Life:

SCC = SAV/SACR

SACR = 10.01 (Geometric mean of 18, 18, 3.1)

SCC = 272.8/10.01 = **27 µg/L**

Data

Table 1. GMAVs and SMAVs for acenaphthene

Genus Mean Acute Value (µg/L)	Species	Species Mean Acute Value (µg/L)	Acute-Chronic Ratio	Reference Number
1700	Bluegill Lepomis macrochirus	1700		1
1,664	Fathead Minnow Pimephales promelas	1,664		2,6
1,720,000	Channel Catfish Ictalurus punctatus	1,720,000		2
623,380	Rainbow Trout Onchorhynchus mykiss	670,000		2
	Brown Trout Salmo trutta	580,000		2
2,040,000	Snail Aplexa hypnorum	2,040,000		2
2097	Cladoceran Daphnia magna	2097		3,4
	Sheepshead Minnow Cyprinodon variegatus		3.1	5

References

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2. Holcombe, G.W., G.L. Phipps and J.T. Frandt 1983. Toxicity of selected priority pollutants to various aquatic organisms. Ecotoxicol. Environ. Saf. 7: 400-409.

3. Munoz, M.J. and J.V. Tarazona 1993. Synergistic effect of two- and four-component combinations of the polycyclic aromatic hydrocarbons: phenanthrene, anthracene, naphthalene an

4. Randall, T.L. and P.V. Knopp 1980. Detoxification of specific organic substances by wet oxidation. J. Water Pollut. Control Fed. 52(8): 2117-2130.

5. USEPA 1980. Ambient water quality criteria for acenaphthene. EPA 440/5-80-015.

6. Geiger, D.L., C.E. Northcott, D.J. Call 1985. Acute toxicities of organic chemiclas to Fathead Minnows (Pimephales promelas). Center for Lake Superior Environmental Studies. University of Wisconsin-Superior Volume II. p. 254.

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

January 16, 1997 Values first developed
August 17, 2000 New search for data. No new studies added.

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