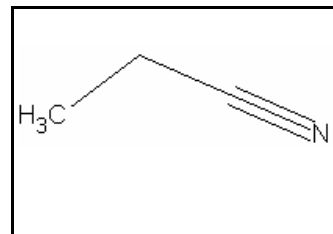




TIER II ACUTE AND CHRONIC AQUATIC LIFE VALUES

ACRYLONITRILE

CAS RN: 107-02-8
Water Solubility: 7.45 g/100 mL
Log K_{ow} : 0.231^P



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 acrylonitrile does not exceed 63 $\mu\text{g/L}$ more than once every three (3) years on the average and if the one (1) hour average concentration does not exceed 570 $\mu\text{g/L}$ more than once every three (3) years on the average.

Calculations

Acute Aquatic Life:

$$\text{SAV} = \text{lowest GMAV/SAF}$$

$$\begin{aligned}\text{Lowest GMAV} &= 9122 \mu\text{g/L} \\ \text{SAF} &= 8.0\end{aligned}$$

$$\text{SAV} = 9122/8.0 = 1140 \mu\text{g/L}$$

$$\text{SMC} = \text{SAV}/2 = 1140/2 = \mathbf{570 \mu\text{g/L}}$$

Chronic Aquatic Life:

$$SCC = SAV/SACR$$

$$SACR = 18$$

$$SCC = 1140/18 = \mathbf{63 \mu g/L}$$

Data

Table 1. GMAVs and SMAVs for acrylonitrile

<u>Genus Mean Acute Value ($\mu\text{g/L}$)</u>	<u>Species</u>	<u>Species Mean Acute Value ($\mu\text{g/L}$)</u>	<u>Acute- Chronic Ratio</u>	<u>Reference Number</u>
12690	Bluegill <u>Lepomis macrochirus</u>	12690		1,2,3
9122	Cladoceran <u>Daphnia magna</u>	9122		4,5
33500	Guppy <u>Poecilia reticulata</u>	33500		3
16088	Fathead Minnow <u>Pimephales promelas</u>	16088		3

References

1. Bailey, H.C., D.H.W. Liu, and H.A. Javitz 1985. Time/toxicity relationships in short-term static, dynamic and plug-flow bioassays. In: Aquatic Toxicology and Hazard Assessment: Eighth Symposium. ASTM STP 891. R.C. Bahner and D.J. Hansen eds. American Society for Testing and Materials, Philadelphia, 1985. pp 193-212.
2. 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.
3. Henderson, C., Q.H. Pickering, A.E. Lemke, et al. 1961. The effect of some organic

cyanides (nitriles) on fish. Proc. 15th Ind. Waste Conf., Eng. Bull. Purdue Univ., Ser. No. 106, 65(2): 120-130.

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

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

September 17, 1997 Values first developed

August 18, 2000 New search for data. No new studies added. Two studies reviewed.

Contact Information

David B. Kallander

Water Quality Standards Section

Indiana Department of Environmental Management

100 North Senate Ave., P.O. Box 6015

Indianapolis, IN 46206-6015

(317) 233-2472

Email: dkalland@dem.state.in.us