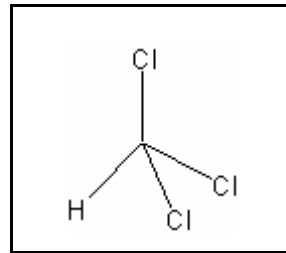




TIER II ACUTE AND CHRONIC AQUATIC LIFE VALUES

CHLOROFORM

CAS RN: 67-66-3
Water Solubility: 0.795 g/100 mL
Log K_{ow} : 1.952



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 chloroform does not exceed 170 $\mu\text{g/L}$ more than once every three (3) years on the average and if the one (1) hour average concentration does not exceed 1300 $\mu\text{g/L}$ more than once every three (3) years on the average.

Calculations

Acute Aquatic Life:

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

$$\begin{aligned} \text{Lowest GMAV} &= 18,000 \mu\text{g/L} \\ \text{SAF} &= 7.0 \end{aligned}$$

$$\text{SAV} = 18,000/7.0 = 2571 \mu\text{g/L}$$

$$\text{SMC} = \text{SAV}/2 = 2571/2 = \mathbf{1300 \mu\text{g/L}}$$

Chronic Aquatic Life:

$$SCV = SAV/SACR$$

$$SACR = 15 \text{ (Geometric mean of 18, 18, 11)}$$

$$SCV = 2571 / 15 = \mathbf{170 \mu g/L}$$

Calculation of ACR's

Daphnia magna

$$NOEC = 1800 \mu g/L$$

$$LOEC = 3600 \mu g/L$$

$$CV = \text{Geometric Mean of 1800 and 3600} = 2546$$

$$ACR = 29000/2546 = 11$$

Notes:

There exists a huge discrepancy between the two available studies on the acute toxicity of chloroform to Daphnia magna. The highest value (758 mg/L) was greater than 10X the next lowest value (66.8 mg/L). The highest value was dropped as an outlier. This did not affect the SAV or SMC values.

Data

Table 1. GMAVs and SMAVs for chloroform

<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>
18,000	Bluegill <u>Lepomis macrochirus</u>	18,000	1	
51,000	Largemouth Bass <u>Micropterus salmoides</u>	51,000	1	
103,000	Fathead Minnow	103,000		4

	<u>Pimephales promelas</u>			
75,000	Channel Catfish <u>Ictalurus punctatus</u>	75,000	1	
18,000	Rainbow Trout <u>Oncorhynchus mykiss</u>	18,000	1	
53,540	Cladoceran <u>Daphnia magna</u>	53,540	11	2,3

References

1. Anderson, D.R. and E.B. Lusty 1980. Acute toxicity and bioaccumulation of chloroform to four species macrochirus,' Bluegill, 'Micropterus salmoides,' largemouth bass, 'Ictalurus punctatus,' channel catfish. Battelle Pacific Northwest Labs. Richland, WA.
2. Gersich, F.M., F.A. Blanchard, S.L. Applegath 1986. The precision of daphnid (Daphnia magna Straus, 1820) static acute toxicity tests. Arch. Environ. Contam. Toxicol. 15: 741-749.
3. LeBlanc, G.A. 1980. Acute toxicity of priority pollutants to Daphnia magna. Bull. Environ. Contam. Toxicol. 24(5): 684-691.
4. Mayes, M.A., H.C. Alexander, and D.C. Dill 1983. A study to assess the influence of age on the response of fathead minnows in static acute toxicity tests.

Acronyms/Abbreviations

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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

August 20, 1997 Values first developed
October 5, 2000 New search for data. No new studies added.

Contact Information

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