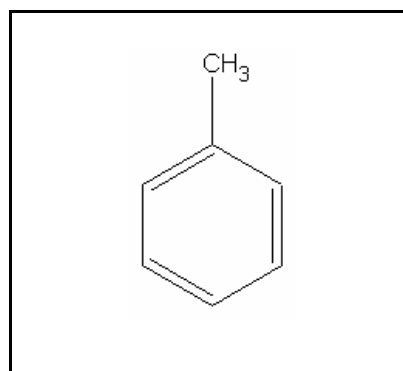




TIER II ACUTE AND CHRONIC AQUATIC LIFE VALUES

TOLUENE

CAS RN: 108-88-3
Water Solubility: 0.0526 g/100 mL
Log K_{ow}: 2.73



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 toluene does not exceed 94 µg/L more than once every three (3) years on the average and if the one (1) hour average concentration does not exceed 840 µg/L more than once every three (3) years on the average.

Calculations

Acute Aquatic Life:

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

$$\begin{aligned}\text{Lowest GMAV} &= 11,798 \text{ } \mu\text{g/L} \\ \text{SAF} &= 7.0\end{aligned}$$

$$\text{SAV} = 11,798/7.0 = 1685 \text{ } \mu\text{g/L}$$

$$\text{SMC} = \text{SAV}/2 = 1685/2 = \mathbf{840 \text{ } \mu\text{g/L}}$$

Chronic Aquatic Life:

$$\text{SCV} = \text{SAV}/\text{SACR}$$

$$\text{SACR} = 18$$

$$\text{SCV} = 1685/18 = \mathbf{94\ \mu\text{g/L}}$$

Notes:

Bluegill LC₅₀'s (13, 24 and 170 mg/L) varied by a factor of greater than 10. The highest value (170 mg/L) was dropped as an outlier.

Data are available for a variety of life stages for fathead minnows. Data showed that the life stages tested were more resistant to toluene by a factor greater than 2 over fathead larvae. Fathead minnow larvae were therefore selected as representative of the species, as required by the GLI (references 2, 4, 8, and 9 were not used for criteria development).

Data

Table 1. GMAVs and SMAVs for toluene

<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>
17,663	Bluegill <u>Lepomis macrochirus</u>	13,000		1
	Bluegill <u>Lepomis macrochirus</u>	24,000		9
17,030	Fathead Minnow <u>Pimephales promelas</u>	17,030		6
240,000	Channel Catfish <u>Ictalurus punctatus</u>	240,000		7
11,798	Rainbow Trout <u>Onchorhynchus mykiss</u>	5,800		3

	Rainbow Trout <u>Onchorhynchus mykiss</u>	24,000	7
40,890	Guppy <u>Poecilia reticulata</u>	28,200	3
	Guppy <u>Poecilia reticulata</u>	59,300	9
310,000	Cladoceran <u>Daphnia magna</u>	310,000	5
57,680	Goldfish <u>Carssius auratus</u>	57,680	9

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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

December 30, 1998 Values first developed
September 20, 2001 New search for data. No studies added.

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