

Rule 57 Aquatic Values Data Sheet

Chemical name: 1,2,3,4-Tetrachlorobenzene Developed by: D. Bush FAV: 35 ug/L (Tier: 2)
 Approved by: *NEQ* AMV: 18 ug/L (Tier: 2)
 C.A.S.#: 634-66-2 Approval date: 7/23/10 FCV: 3.4 ug/L (Tier: 2)
 Literature search date: 6/24/10 Acute CF: ---- Chronic CF: ----

ACUTE DATA

Species	Test type (EC or LC50)	Duration (hours)	Test conditions (FT,M, etc.)	Hardness mg/L	Chemical	LC50/EC50 ug/L	SMAV ug/L	GMAV ug/L	Rank	Reference
Water flea (<i>Daphnia magna</i>)	EC50	48	S,M	160		280	280	280	1	1
Midge (<i>Chironomus riparius</i>)	LC50	48	S,M			730	730	730	2	5
	LC50	96	S,M			497*				
Fathead minnow (<i>Pimephales promelas</i>)	LC50	96	FT,M	44-46		1,100	739	739	3	2, 3
	LC50	96	FT,M			497				4

*This value was not used because a study of a more appropriate duration (48 hours) was available for this species.

CHRONIC DATA

Species	Test type (ELS, etc.)	Duration (days)	Study Conditions (FT,M etc.)	Hardness mg/L	NOEC/LOEC	MATC ug/L	SMCV ug/L	GMCV ug/L	Rank	Reference
Fathead minnow (<i>Pimephales promelas</i>)	ELS	28	FT,M	44-46	250/410	320	320	320	1	2

References:

1. Marchini, S., L. Passerini, M.D. Hoglund, A. Pino, and M. Nendza. 1999. Toxicity of aryl- and benzylhalides to *Daphnia magna* and classification of their mode of action based on quantitative structure-activity relationship. Environ. Toxicol. Chem. 18:2759-2766.
2. Carlson, A.R. and P.A. Kosian. 1987. Toxicity of chlorinated benzenes to fathead minnows (*Pimephales promelas*). Arch. Environ. Contam. Toxicol. 16:129-135.
3. Veith, G.D., D.J. Call, and L.T. Brooke. 1983. Estimating the Acute Toxicity of Narcotic Industrial Chemicals to Fathead Minnows. In: Aquatic Toxicology and Hazard Assessment: Sixth Symposium. ASTM STP 802.
4. Hodson, P.V., D. G. Dixon, and K.L.E. Kaiser. 1988. Estimating the acute toxicity of waterborne chemicals in trout from measurements of median lethal dose and the octanol-water partition coefficient. Environ. Toxicol. Chem. 7:443-454.
5. Roghair, C.J., A. Buijze, E.S.E. Yedema, and J.L.M. Hermens. 1994. A QSAR for base-line toxicity to the midge *Chironomus riparius*. Chemosphere 28:989-997.
6. Leslie, H.A., A.J.P. Oosthoek, F.J.M. Busser, Michiel H.S. Kraak, and J.L.M. Hermens. 2002. Biomimetic solid-phase microextraction to predict body residues and toxicity of chemicals that act by narcosis. Environ. Toxicol. Chem. 21:229-234.

References reviewed, but rejected:

1. Leslie, H.A., M.H.S. Kraak, and J.L.M. Hermens. Chronic toxicity and body residues of the nonpolar narcotic 1,2,3,4-tetrachlorobenzene in *Chironomus riparius*. Environ. Toxicol. Chem. 23:2022-2028. (static test, low temperature, etc.)

Min. data req. met	Acute Factor
2	13
3	8
4	7
5	6.1
6	5.2
7	4.3

Rule 57 Aquatic Values Work Sheet

Chemical Name: 1,2,3,4-Tetrachlorobenzene

C.A.S. #: 634-66-2

AQUATIC MAXIMUM VALUE CALCULATIONS

A. Minimum 8 species requirement is **not** met. Minimum requirements met = 3 (ii, iv, vi)

Minimum requirements missing for Tier I = 5

Acute factor = 8 (i, ii, v, vii, viii)

1. Toxicity is **not** dependent on a water characteristic

a. FAV calculation $FAV = \frac{280 \text{ ug/L}}{8} = 35 \text{ ug/L}$

2. Toxicity is dependent on a water characteristic

a. Slope = (Table)

b. FAV equation:

3. Go to C.

B. Minimum 8 species requirement **is** met (Tier I)

1. Toxicity is **not** dependent on a water characteristic

a. FAV calculation: Att.

2. Toxicity is dependent on a water characteristic

a. Slope = (Table)

b. Ranked genus mean acute intercepts: Table

c. Final acute intercept = (Att.)

ln of final acute intercept =

d. FAV equation =

C. Aquatic Maximum Value (AMV) calculation:

$$AMV = \frac{280 \text{ ug/L}}{8} \div 2 = 17.5 \text{ ug/L} = 18 \text{ ug/L}$$

FINAL CHRONIC VALUE CALCULATIONS

- A. Minimum 8 species requirement is **not** met (Tier II). Minimum requirements met = 1
Minimum requirements missing for Tier I = 7

1. Acute to chronic ratio

a. Number ACRs meeting minimum data requirements = 1 (Table)

b. Acute to chronic ratio = $\sqrt[3]{18 \times 18 \times \left(\frac{1100 \text{ } \mu\text{g/L}}{320 \text{ } \mu\text{g/L}}\right)} = 10.3656$

2. Toxicity **is not** dependent on a water characteristic

$$\text{FCV} = \frac{280 \text{ } \mu\text{g/L}}{8} \div 10.3656 = 3.38 \text{ } \mu\text{g/L} = 3.4 \text{ } \mu\text{g/L}$$

3. Toxicity **is** dependent on a water characteristic

a. Slope = (Table)

b. Aquatic chronic intercept = (Table)

ln of aquatic chronic intercept =

c. FCV equation =

B. Minimum 8 species requirement **is** met (Tier I)

1. Toxicity **is not** dependent on a water characteristic

a. FCV = (Att.)

2. Toxicity **is** dependent on a water characteristic

a. Slope = (Table)

b. Ranked genus mean chronic intercepts: Table

c. Final chronic intercept = (Att.); ln of final chronic intercept =

d. FCV equation =