

Rule 57 Aquatic Values Data Sheet

9/17/2004

Chemical or product name: 1,2-Dichloroethane
 Manufacturer (WTAs): -----
 C.A.S #: 107-06-2

Developed by: Christopher Hull
 Approved by: D. Bush
 Approval date: 9/17/04
 Literature search date: 8/18/04
 Clearinghouse search date: 6/20/96

FAV*: 16,000 ug/l (Tier: II)
 AMV*: 8,200 ug/l (Tier: II)
 FCV*: 2,000 ug/l (Tier: II)
 Acute CF: --- Chronic CF: ---

ACUTE DATA

| Species | Test Endpoint (EC or LC50) | Duration (hours) | Test Type (FT,M, etc.) | Hardness mg/L | Test Chemical | LC50/EC50 ug/L | SMAV ug/L | GMAV ug/L | Rank | Reference |
|--|-------------------------------|---------------------|---------------------------|------------------|------------------|------------------------|--------------|--------------|------|-----------|
| Amphipod (<i>Gammarus fasciatus</i>) | LC50 | 96 | S,U | 44 | ---- | >100,000 | >100,000 | >100,000 | 1 | 1 |
| Stonefly (<i>Pteronarcys californica</i>) | LC50 | 96 | S,U | 44 | ---- | >100,000 | >100,000 | >100,000 | 2 | 1 |
| Fathead Minnow (<i>Pimephales promelas</i>) | LC50 | 96 | FT,M | 56.3 | ---- | 118,000 | 123,015 | 123,015 | 3 | 2,3,4 |
| | LC50 | 96 | FT,M | 45.1 | ---- | 116,000 | | | | 5 |
| | LC50 | 96 | FT,M | 44.8 | ---- | 136,000 | | | | 6 |
| Water Flea (<i>Daphnia magna</i>) | LC50 | 48 | S,U | 72.0 | ---- | 220,000 | 184,662 | 184,662 | 4 | 7 |
| | LC50 | 48 | S,M | 44.7 | ---- | 268,000 ^{1,2} | | | | 8,9 |
| | EC50 | 48 | S,M | 44.7 | ---- | 155,000 ¹ | | | | 8,9 |
| Rainbow Trout (<i>Oncorhynchus mykiss</i>) | LC50 | 96 | S,U | 44 | ---- | 225,000 | 225,000 | 225,000 | 5 | 1 |

CHRONIC DATA

| Species | Test type (ELS, etc.) | Duration (days) | Study Conditions (FT,M etc.) | Hardness mg/L | Chemical | MATC ug/L | SMCV ug/L | GMCV ug/L | Rank | Reference |
|--|--------------------------|--------------------|------------------------------------|------------------|----------|-----------------------|--------------|--------------|------|-----------|
| Water Flea (<i>Daphnia magna</i>) | LC | 28 | SR,M | 45 | ----- | 14,813 ^{1,3} | 14,813 | 14,813 | 1 | 8,9 |
| Fathead Minnow (<i>Pimephales promelas</i>) | ELS | 32 | FT,M | 45 | ----- | 41,364 ⁴ | 41,364 | 41,364 | 2 | 4 |

* Value rounded to two significant figures.

¹ Value reported in Ref. # 8 is rounded to 2 significant figures. The unrounded value reported in Ref. # 9 is used here.

² Value not used to calculate SMAV, because EC50 preferred over LC50 from the same test.

³ See Table 1 for calculation of MATC and ACR.

⁴ See Table 2 for calculation of MATC and ACR.

Note: A literature search conducted on 7/23/2012 revealed no additional studies that could be used for the development of aquatic life values (D. Bush).

TETRACHLOROETHYLENE REFERENCES, 12/03

References Used:

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3. #SH 177 .C41, PB 83 263665: Call, D. J., Brooke, L. T., Ahmad, N., and Richter, J. E. 1983. Toxicity and metabolism studies with EPA Priority Pollutants and related chemicals in freshwater organisms. EPA 600/3-83-095, U.S. EPA, Duluth, MN:120 p.
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| 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-Dichloroethane
 C.A.S. #: 107-06-2

AQUATIC MAXIMUM VALUE CALCULATIONS

A. Minimum 8 species requirement is **not** met. Minimum requirements met = 5 (i, iii, iv)
 Minimum requirements missing for Tier I = 3 (ii, vii, viii)
 Acute factor = 6.1

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

a. Final Acute Value (FAV) = $100,000 \text{ ug/l} / 6.1 = 16,393 \text{ ug/l} = 16,000 \text{ ug/l}$

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) = $FAV \div 2 = 16,393 \text{ ug/l} / 2 = 8,196 \text{ ug/l} = 8,200 \text{ ug/l}$

FINAL CHRONIC VALUE CALCULATIONS

A. Minimum 8 species requirement is **not** met (Tier II). Minimum requirements met = 2
Minimum requirements missing for Tier I = 1

1. Acute to chronic ratio

a. Number ACRs meeting minimum data requirements = 2 (Tables 1-2)
D. magna ACR = 10.46; FHM ACR = 2.85

b. Acute to chronic ratio = geometric mean of 10.46, 2.85 and 18 = 8.1297

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

FCV = FAV + ACR = 16,393 ug/l / 8.1297 = 2016 ug/l = 2,000 ug/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 =

Table 1. Calculation of MATC and ACR for *Daphnia magna**

$$48\text{-hr. EC50} = 155,000 \text{ } \mu\text{g/L}$$

$$\begin{aligned} 28\text{-day MATC (reprod.)} &= \bar{X}_g (\text{NOAEL}; \text{LOAEL}) \\ &= \bar{X}_g (10,600 \text{ } \mu\text{g/L}; 20,700 \text{ } \mu\text{g/L}) \\ &= \underline{14,813 \text{ } \mu\text{g/L}} \end{aligned}$$

$$\text{ACR} = \frac{48\text{-hr. EC50}}{28\text{-day MATC}} = \frac{155,000 \text{ } \mu\text{g/L}}{14,813 \text{ } \mu\text{g/L}} = \underline{10.463782}$$

* These tests are reported in Refs. # 8 and 9. Ref. # 8 data are rounded; Ref. # 9 data are unrounded. Therefore, Ref. # 9 data are used here.

Table 2. Calculation of MATC and ACR for Fathead Minnow.

$$96\text{-hr. LC50} = 118,000 \text{ } \mu\text{g/L (Ref. #4)}$$

$$\begin{aligned} 32\text{-day MATC (growth)} &= \bar{X}_g (\text{NOAEL}; \text{LOAEL}) \\ &= \bar{X}_g (29,000 \text{ } \mu\text{g/L}; 59,000 \text{ } \mu\text{g/L}) \text{ (Ref. #4)} \\ &= \underline{41,364 \text{ } \mu\text{g/L}} \end{aligned}$$

$$\text{ACR} = \frac{96\text{-hr. LC50}}{32\text{-day MATC}} = \frac{118,000 \text{ } \mu\text{g/L}}{41,364 \text{ } \mu\text{g/L}} = \underline{2.8527222}$$