

Rule 57 Aquatic Values Data Sheet

11/30/2007

Chemical or product name: 1,1,2-Trichloroethane  
 Manufacturer (WTAs): -----  
 C.A.S #: 79-00-5

Developed by: Christopher Hull FAV\*: 6,400 ug/l  
 Approved by: D. Bush AMV\*: 3,200 ug/l  
 Approval date: 2/11/08 FCV\*: 730 ug/l  
 CAS, AQUIRE: 8/06/07 Acute CF: ---- Chronic CF: ----  
 Clearinghouse search date: 6/12/96

(Tier: II)  
 (Tier: II)  
 (Tier: II)

ACUTE DATA

Species	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
American Flagfish ( <i>Jordanella floridae</i> )	LC50	96	FT,M	48	-----	45,117	45,117	45,117	1	1
	LC50	96	SR,U	48	-----	89,100 <sup>1</sup>				1
Water Flea	EC50	48	S,M	43.0	-----	80,600 <sup>2</sup>	80,600	80,600	2	2,3,4
( <i>Daphnia magna</i> )	LC50	48	S,M	43.0	-----	186,000 <sup>2,3</sup>				2,3,4
	EC50	48	S,M	44.7	-----	81,000				5
	LC50	48	S,M	44.7	-----	190,000				5
	LC50	48	S,U	173	-----	18,000 <sup>4</sup>				6
Fathead Minnow ( <i>Pimephales promelas</i> )	LC50	96	FT,M	45.1	-----	81,600	81,686	81,686	3	7
	LC50	96	FT,M	45.2	-----	81,600				8
	LC50	96	FT,M	45.08	-----	81,600				2
	LC50	96	FT,M	56.3	-----	81,700				9
	LC50	96	FT,M	45.5	-----	81,700				10
	LC50	96	FT,M	44.6	-----	81,800				11
	LC50	96	FT,M	45	-----	81,800				12
Midge ( <i>Chironomus riparius</i> ) <sup>5</sup>	LC50	48	S,U	210	-----	147,000	147,000	147,000	4	13

CHRONIC DATA

Species	Test type (ELS, etc.)	Duration (days)	Study Conditions (FT,M etc.)	Hardness mg/L	Test Chemical	MATC ug/L	SMCV ug/L	GMCV ug/L	Rank Reference	
									1	2
Fathead Minnow ( <i>Pimephales promelas</i> )	ELS	32	FT,M	45	-----	9423 <sup>6</sup>	9,423	9,423	1	2
Water Flea	LC	28	SR,M	44.4	-----	18,526 <sup>7,8</sup>	18,526	18,526	2	2,3,4
( <i>Daphnia magna</i> )	LC	28	SR,M	44.7	-----	18,385 <sup>7</sup>				5

\*Value rounded to 2 significant figures.

<sup>1</sup> Value not used for calculations of SMAV because FT,M test values are preferred over values from any other test type.

<sup>2</sup> These data were used to calculate the SMAV, because they are unrounded. Values from Ref. #5, while from the same test, are rounded.

<sup>3</sup> Value not used for calculation of SMAV, because EC50 preferred over LC50 from the same test.

<sup>4</sup> Value not used for calculation of SMAV, because it is an outlier value to all other data in the database.

<sup>5</sup> This species has now been shown to be North American.

<sup>6</sup> See Table 1 for MATC and ACR calculations.

<sup>7</sup> See Table 2 for MATC and ACR calculations.

<sup>8</sup> Value used for calculations of SMCV for the same reasons outlined in footnote #2 (see Table 2).

Table 1. MATC and ACR calculations for Fathead Minnow.  
Acute and chronic data from Ref. #2.

Acute:

- 96-hr. LC50 = 81,600 µg/L

Chronic (32-day ELS test):

- 32-day growth NOEC = 6,000 µg/L; LOEC = 14,800 µg/L; MATC =  
 $\bar{X}_g = 9,423 \mu\text{g/L}$

$$\text{ACR} = \frac{96\text{-hr. LC50}}{32\text{-day growth MATC}} = \frac{81,600 \mu\text{g/L}}{9,423 \mu\text{g/L}} = \underline{8.6596625}$$

TABLE 2. MATC and ACR calculations for Daphnia magna.

Refs. #2, 3, 4:

48-hr. EC50 = 80,600 µg/L

28-day NOEC (reprod.) = 26,500 µg/L; LOEC = 41,800 µg/L; MATC =  $\bar{x}_g = \frac{32,960 \mu\text{g/L}}{2}$

Most Sensitive →

(growth) = 13,200 ~~~~~ 26,000 ~~~~~ 18,526 µg/L

ACR =  $\frac{48\text{-hr. EC50}}{28\text{-day MATC (gr.)}} = \frac{80,600 \mu\text{g/L}}{18,526 \mu\text{g/L}} = \underline{4.3506423}$

Ref. #5 :

48-hr. EC50 = 81,000 µg/L

28-day NOEC (reprod.) = 26,000 µg/L; LOEC = 42,000 µg/L; MATC =  $\bar{x}_g = \frac{33,045 \mu\text{g/L}}{2}$

Most Sensitive →

(growth) = 13,000 ~~~~~ 26,000 ~~~~~ 18,385 µg/L

ACR =  $\frac{48\text{-hr. EC50}}{28\text{-day MATC (gr.)}} = \frac{81,000 \mu\text{g/L}}{18,385 \mu\text{g/L}} = \underline{4.4057656}$

\* Refs. #2-5 all report data from the same tests, w/ data from Refs. #2-4 being unrounded, & data from Ref. #5 being rounded. Therefore, the unrounded data from Refs. #2-4 are used here to calculate the SMACR for Daphnia magna.

∴ SMACR for D. magna = 4.3506423

*C. H. Hull*

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: 1,1,2-TRICHLOROETHANE  
 C.A.S. #: 79-00-5

### AQUATIC MAXIMUM VALUE CALCULATIONS, 11/07

A. Minimum 8 species requirement is **not** met (Tier II). Minimum requirements met = 4.  
 Minimum requirements missing for Tier I = 4 (i, v, vii, viii).  
 Acute factor = 7.

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

a. FAV calculation =  $\frac{\text{lowest GMAU}}{\text{Acute Factor}} = \frac{45,117 \mu\text{g/L}}{7} = \boxed{6,445.2857 \mu\text{g/L}}$

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:  $AMV = \frac{FAV}{2} = \frac{6,445.2857 \mu\text{g/L}}{2}$

$= \boxed{3,222.6429 \mu\text{g/L}}$

1,1,2-TRICHLOROETHANE:

CRIST HULL

FINAL CHRONIC VALUE CALCULATIONS, 11/07

A. Minimum 8 species requirement is **not** met (Tier II). Minimum requirements met = 2 (iii, iv).  
Minimum requirements missing for Tier I = 6 (i, ii, v, vi, vii, viii) (BMCV route)  
= 1 (ACR route)

1. Acute to chronic ratio

a. Number ACRs meeting minimum data requirements = 2 (Tables 1-2)

b. Acute to chronic ratio =  $\bar{X}_g$  (FHM ACR (Table 1), D. magna ACR (Table 2), 18)  
=  $\bar{X}_g$  (8.6596625, 4.3506423, 18) = 8.7856848

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

$$FCV = \frac{FAV}{ACR} = \frac{6,445.2857 \text{ mg/L}}{8.7856848} = \boxed{733.61222 \text{ mg/L}}$$

~~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 =~~

## 1,1,2-TRICHLOROETHANE REFERENCES, 11/07

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- QSAR; SD; TONS.

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-Not translated at this time.

\* For abbreviations used, see Appendix (attached).

## APPENDIX: REFERENCE ABBREVIATIONS USED, 9/07

AMD = ambient monitoring data.  
BCF = bioconcentration factor.  
D = data (as a suffix to other abbreviations listed here).  
DEP = depuration data.  
DO = data only (as a suffix to other abbreviations listed here).  
EF = environmental fate.  
GWD = groundwater data.  
IITM/C = insufficient information on test methods / conditions.  
ISD = *in situ* data.  
LD = leachate data.  
LSER = Linear Solvation Energy Relationship.  
MCD = microcosm data.  
MIX = mixture (not chemical-specific) test data.  
MED = model ecosystem data.  
MET = metabolism  
MOD = model (theoretical) data / analysis.  
NA = not available at this time.  
ND = no data (on this chemical).  
NIL = not in (MDEQ) Library.  
NR = not reviewed.  
NUE = no useable endpoint.  
O = only (as a suffix to other abbreviations listed here).  
PD = phytotoxicity data.  
PHYS = physiological data.  
QSAR = Quantitative Structure-Activity Relationship.  
RWD = receiving water data.  
SD = secondary data.  
SED = sediment data or testing.  
SW = saltwater.  
TATO = test animals too old.  
TDI = test duration inappropriate.  
TM/CU = test methods / conditions unacceptable.  
TONNA = test organisms not North American.  
TONS = test organisms not suitable.  
UD or UP = uptake data.  
WET = whole-effluent testing.