Rule 57 Aquatic Values Data Sheet

10/30/2006

Chemical or product name: 2,4-Dichlorophenol
Manufacturer (WTAs): -----
C.A.S #: 120-83-2

Developed by: Christopher Hull *FAV*: 180 ug/l* *(Tier: II)*
Approved by: D. Bush *AMV*: 92 ug/l* *(Tier: II)*
Approval date: 7/2/08 *FCV*: 11 ug/l* *(Tier: II)*
CAS, AQUIRE: 2/15,14/06 *Acute CF: ----* *Chronic CF: ----*
Clearinghouse search date: 6/13/96

ACUTE DATA

Species	Endpoint (EC or LC50)	Duration (hours)	Test Type (FT,M, etc.)	Hardness mg/L	Test pH	LC50/EC50 ug/L	SMAV ug/L	GMAV ug/L	Rank	Reference
Goldfish	LC50	96	FT,M	50	7.8	1,760	1,477	1,477	1	1,2
(*Carassius auratus*)	LC50	96	FT,M	200	7.8	1,240				1,2
Channel Catfish	LC50	96	FT,M	50	7.8	1,850	1,773	1,773	2	1,2
(*Ictalurus punctatus*)	LC50	96	FT,M	200	7.8	1,700				1,2
Water Flea	LC50	48	S,U	173	8.0 [1]	2,600	2,600	2,600	2	3
(*Daphnia magna*)										
Fathead Minnow	LC50	96	FT,M	45	7.38	7,750	8,795	8,795	3	4,5 [2]
(*Pimephales promelas*)	LC50	96	FT,M	45	7.8	11,600				5
	LC50	96	FT,M	46	7.58-9.10	8,200				6
	LC50	96	FT,M	46	7.58-9.10	8,300				6
	LC50	96	FT,M	-----	7.8-8.1	8,600				7
	LC50	96	S,U	-----	7.8-8.1	6,900 [3]				7

(cont'd.)

Species	Test type (ELS, etc.)	Duration (days)	Study Conditions (FT,M etc.)	Hardness mg/L	Test pH	MATC ug/L	SMCV ug/L	GMCV ug/L	Rank	Reference
Fathead Minnow	ELS	31	FT,M	-----	7.8-8.1	795 [4]	539	539	1	7
(*Pimephales promelas*)	ELS	32	FT,M	46	7.2-7.9	365 [4]				8
Water Flea (*Daphnia magna*)	LC	21	SR,M	-----	7.8-8.1	1,047 [5]	1,047	1,047	2	9

*Value rounded to 2 significant figures.

[1] Figure reported is for diluent, only; not test solution. This chemical affects pH, but test pHs were not reported.

[2] This reference reports a slightly different hardness and pH for this test, due to differences in calculation.

[3] Value not used to calculate SMAV because FT,M data are preferred over data from other test types.

[4] See Table 1 for MATC and ACR calculations.

[5] See Table 2 for MATC and ACR calculations.

Table I. MATC and ACR calculations for Fathead Minnows (2,4-DCP).

Ref. # 7:

31-day survival NOEC = 620 ug/L; LOEC = 1,020 ug/L;

MATC = $\bar{X}_g$ = 795.23581 ug/L.

$$ACR = \frac{96\text{-hr. FT/M LC50 (Ref. \# 7)}}{31\text{-day surv. MATC (Ref. \# 7)}} = \frac{8,600 \text{ ug/L}}{795.23581 \text{ ug/L}} = 10.814402.$$

Ref. # 8:

32-day survival NOEC = 290 ug/L; LOEC = 460 ug/L;

MATC = $\bar{X}_g$ = 365.23965 ug/L.

$$ACR = \frac{\bar{X}\ 96\text{-hr. LC50 (Ref. \# 6)}^{*}}{32\text{-day MATC (Ref. \# 8)}} = \frac{8,250 \text{ ug/L}}{365.23965 \text{ ug/L}} = 22.587909.$$

FHM SMACR = $\bar{X}_g$ (Ref. # 7 ACR, Ref. # 6/# 8 ACR)

= $\bar{X}_g$ (10.814402, 22.587909)

= 15.629291

* Ref. # 6 is by the same researchers & laboratory as Ref. # 8, using the same dilution water and the same in-house cultures. The acute value used is the $\bar{X}_g$ of 2 tests.

Table 2. MATC and ACR calculations for Daphnia magna (2,4-DCP)

Ref. # 9:

21-day survival & reproduction NOEC = 0.74 mg/L; LOEC = 1.48 mg/L;

MATC = $\bar{X}_g$ = 1.046518 mg/L.

ACR: Cannot be calculated, due to lack of suitable acute data.

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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: 2,4-DICHLOROPHENOL
C.A.S. #: 120-83-2

AQUATIC MAXIMUM VALUE CALCULATIONS, 10/06

A. Minimum 8 species requirement is **not** met (Tier II). Minimum requirements met = 3.
Minimum requirements missing for Tier I = 5 (i, v, vi, vii, viii).
Acute factor = 8.

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

   a. FAV calculation $FAV = \frac{\text{lowest GMAV}}{\text{Acute Factor}} = \frac{1,477 \text{ ug/L}}{8} = 184.625 \text{ ug/L}$

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: $AMV = \frac{FAV}{2} = \frac{184.625 \text{ ug/L}}{2} = 92.3125 \text{ ug/L}$

2,4-DICHLOROPHENOL

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FINAL CHRONIC VALUE CALCULATIONS, 10/06

A. Minimum 8 species requirement is **not** met (Tier II). Minimum requirements met = 2 (GMCV ROUTE)
Minimum requirements missing for Tier I = 6 (i, ii, v, vi, vii, viii) (GMCV route) 1 (ACR ROUTE).
2 (fish and invertebrate) (ACR route)

1. Acute to chronic ratio

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

   b. Acute to chronic ratio = $\bar{X}g$ (Table 1 ACR (FHM), 18, 18)
   $= \bar{X}g(15.629291, 18, 18) = 17.172285$

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

   $FCV = \frac{FAV}{ACR} = \frac{184.625 \text{ ug/L}}{17.172285} = 10.751336 \text{ ug/L}$

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 =

2,4-DICHLOROPHENOL REFERENCES, 8/06

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* For abbreviations used, see Appendix.

APPENDIX: REFERENCE ABBREVIATIONS USED, 7/06

AMD = ambient monitoring data.
BCF = bioconcentration factor.
D = data (as a suffix to other abbreviations listed here).
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.
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.