

STATIC ACUTE *Ceriodaphnia dubia* TOXICITY TEST

Client Port of Seattle
 Sample Cu in Miller Creek Site Water
 Test Dates 2/23/99 through 2/25/99

Sample Collection Date 2/22/99
 Test Initiation Time 11:45
 Source/Age of Organisms In House / <24 hours

Temp (°C) Day 0 20 Day 1 20 Day 2 20

Conc.	Rep.	Number of Organisms			pH			Dissolved Oxygen (mg/L)			Specific Conductivity (µS)	
		0	24	48	0	24	48	0	24	48	0	48
		Control	A	5	5	5	7.1	8.0	8.0	9.0	8.5	8.5
	B	5	5	5								
1.5625 µg/L	A	5	5	5	7.1	8.0	8.0	9.0	8.4	8.5	111	130
	B	5	5	5								
3.125 µg/L	A	5	5	5	7.1	8.0	8.0	9.0	8.4	8.5	111	137(1)
	B	5	5	5								
6.25 µg/L	A	5	5	5	7.1	8.0	8.1	9.1	8.4	8.5	111	124
	B	5	5	5								
12.5 µg/L	A	5	5	5	7.1	8.0	8.1	9.1	8.5	8.5	111	128
	B	5	5	5								
25 µg/L	A	5	5	5	7.1	8.0	8.1	9.1	8.5	8.5	111	117
	B	5	5	5								
50 µg/L	A	5	5	5	7.0	7.9	8.1	9.1	8.4	8.5	111	119
	B	5	5	5								
100 µg/L	A	5	3-2	0-3	7.0	7.9	8.0	9.1	8.4	8.5	111	121
	B	5	2-3	0-2								
150 µg/L	A	5	0-5	0	6.9	8.0	8.0	9.2	8.5	8.6	111	123
	B	5	0-5	0								
200 µg/L	A	5	0-5	0	6.9	8.0	8.0	9.2	8.6	8.6	111	117
	B	5	0-5	0								

Initials: JHM JHM gm NM JHM gm NM JHM gm NM gm
 Date: 2/23 2/24 2/25 2/23 2/24 2/25 2/23 2/24 2/25 2/23 2/25

NT = Not Taken

Comments: (1) DC gm should read: 127 2/25/99

Parametrix Toxicology Laboratory

WATER FLEA TEST DATA

Test Number: 2183

() Chronic (x) Acute 48 hours

Test Date: 23-Feb-99

Source: WA0024651

Test Material: CUSW (µg/L)

Conc	Rep	Cont. No. Sex	Start	Daily Survival						Prop Alive	Total Young	Max Young
				1	2	3	4	5	6			
0.00 D	1	F	5	5						1.00		
0.00 D	2	F	5	5						1.00		
1.56 D	1	F	5	5						1.00		
1.56 D	2	F	5	5						1.00		
3.13 D	1	F	5	5						1.00		
3.13 D	2	F	5	5						1.00		
6.25 D	1	F	5	5						1.00		
6.25 D	2	F	5	5						1.00		
12.50 D	1	F	5	5						1.00		
12.50 D	2	F	5	5						1.00		
25.00 D	1	F	5	5						1.00		
25.00 D	2	F	5	5						1.00		
50.00 D	1	F	5	5						1.00		
50.00 D	2	F	5	5						1.00		
100.00 D	1	F	5	0						0.00		
100.00 D	2	F	5	0						0.00		
150.00 D	1	F	5	0						0.00		
150.00 D	2	F	5	0						0.00		
200.00 D	1	F	5	0						0.00		
200.00 D	2	F	5	0						0.00		

PREPARED BY Cent 2/26/99
 CHECKED BY DT 3/2/99

Parametrix Toxicology Laboratory

WATER FLEA TEST DATA

Test Number: 2183 () Chronic (x) Acute 48 hours
 Test Date: 23-Feb-99
 Source: WA0024651 Test Material: CUSW (µg/L)

Conc	Rep	Cont.		Start	Daily Survival						Prop Alive	Total Young	Max Young
		No.	Sex		1	2	3	4	5	6			
0.00	D	1	F	5	5							1.00	
0.00	D	2	F	5	5							1.00	
1.56	D	1	F	5	5							1.00	
1.56	D	2	F	5	5							1.00	
3.13	D	1	F	5	5							1.00	
3.13	D	2	F	5	5							1.00	
6.25	D	1	F	5	5							1.00	
6.25	D	2	F	5	5							1.00	
12.50	D	1	F	5	5							1.00	
12.50	D	2	F	5	5							1.00	
25.00	D	1	F	5	5							1.00	
25.00	D	2	F	5	5							1.00	
50.00	D	1	F	5	5							1.00	
50.00	D	2	F	5	5							1.00	
100.00	D	1	F	5	0							0.00	
100.00	D	2	F	5	0							0.00	
150.00	D	1	F	5	0							0.00	
150.00	D	2	F	5	0							0.00	
200.00	D	1	F	5	0							0.00	
200.00	D	2	F	5	0							0.00	

Parametrix Toxicology Laboratory

Test Date: 2/23/99
 Sample Date: 2/23/99
 Species: Ceriodaphnia dubia
 Test Type: Acute - 48 hours

Test Number: 2183
 Test Material: Copper Site Water µg/L
 Source: WA0024651
 Port of Seattle

SUMMARY

End Point	Day	Transformation	Conc	#Reps	Mean	StDev	% Surv
Proportion Alive	2	Arc sine sqrt w/ adj.	X 0.000 D	2	1.35	0.000	
			X 1.563 D	2	1.35	0.000	
			X 3.125 D	2	1.35	0.000	
			X 6.250 D	2	1.35	0.000	
			X 12.500 D	2	1.35	0.000	
			X 25.000 D	2	1.35	0.000	
			X 50.000 D	2	1.35	0.000	
			100.000 D	2	.23	0.000	
			150.000 D	2	.23	0.000	
			200.000 D	2	.23	0.000	
			Proportion Alive	2	No transformation	0.000 D	2
1.563 D	2	1.00				0.000	
3.125 D	2	1.00				0.000	
6.250 D	2	1.00				0.000	
12.500 D	2	1.00				0.000	
25.000 D	2	1.00				0.000	
50.000 D	2	1.00				0.000	
100.000 D	2	0.00				0.000	
150.000 D	2	0.00				0.000	
200.000 D	2	0.00				0.000	

X = indicates concentrations used in calculations

- HYPOTHESIS TEST -

End Point	Day	Transformation/Analysis	NOEC	LOEC	TU	MSE	MSD
Proportion Alive	2	Arc sine sqrt w/ adj. Dunnett + t-test					

- PROPORTION POINT ESTIMATE -

End Point	Day	Method	P	Conc	95% CI	TU
Proportion Alive	2	Graphical Interpolation	EC 50	70.711		1.41

Water Flea

Lab	Species	Test Date	Test Material	Permit	Protocol	Test Number
WAPTL	CD	2/23/99	CUSW ($\mu\text{g/L}$)	WA0024651	EPAA 91	2183

Statistics Parameters

PROPORTION

End Point: PA Proportion Alive
 Analysis: EPA Flowchart (Chronic and Acute) 1 control
 Transform: Arc sine square root w/ Bartlett adj.
 Tail: One-tailed, decreasing
 Constant: -.01 Variance: .01
 Root: -1.00 Alpha Normality: .01
 NOEC: .05

EC/LC Method: F (P,S,G,L,N) Superdunnet: 4000

GROWTH

End Point: GR Reproduction
 Analysis: No Analysis
 Transform:
 Tail:
 Constant: .01 Variance: .01
 Root: Alpha Normality: .01
 NOEC: .05

Calculate IC? N (Y,N) IG resamples: 120

Errors/Warnings

Type Number
 EC/LC 0 Analysis completed with no errors
 PROP 40 No variation in the data

Graphical Interpolation Analysis For EC/LC

Parametrix Toxicology Laboratory

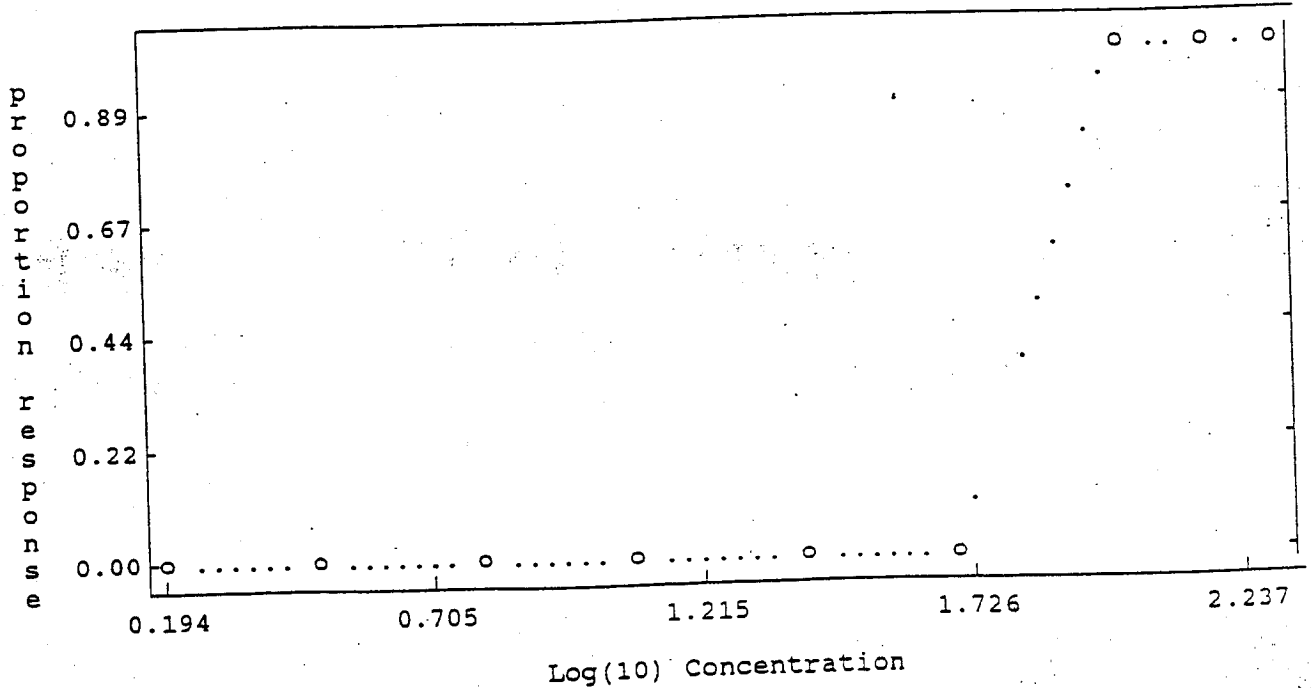
Species: Ceriodaphnia dubia
 Test Material: Copper Site Water ($\mu\text{g/L}$)
 Endpoint: Prop

Test Number: 2183
 Test Date: 2/23/99

Concentration	Mean	Pooled Mean	Proportion Response
0.0000	0.0000	0.0000	
1.5625	0.0000	0.0000	0.0000
3.1250	0.0000	0.0000	0.0000
6.2500	0.0000	0.0000	0.0000
12.5000	0.0000	0.0000	0.0000
25.0000	0.0000	0.0000	0.0000
50.0000	0.0000	0.0000	0.0000
100.0000	1.0000	1.0000	1.0000
150.0000	1.0000	1.0000	1.0000
200.0000	1.0000	1.0000	1.0000

Note: Quantal data were input.
 Note: Proportion response computed by applying Abbott's formula to the pooled means.

P Value	Estimated Concentration
100	70.7107



2/26/99

TOXIS ANALYSIS SUMMARY

Ceriodaphnia		Proportion Alive				Day 2
--------------	--	------------------	--	--	--	-------

Lab	Species	Date	Test Material	Permit	Protocol	Test Number
WAPTL	CD	2/23/99	CUSW ($\mu\text{g/L}$)	WA0024651	EPAA 91	2183

EPA Flowchart (Chronic and Acute)	1 control
-----------------------------------	-----------

Transformation		Conc	Mean	SD	N	
Arc sine sqrt w/ adj.	X	0.00D	1.35	0.000	2	
	X	1.56D	1.35	0.000	2	
	X	3.13D	1.35	0.000	2	
	X	6.25D	1.35	0.000	2	
	X	12.50D	1.35	0.000	2	
	X	25.00D	1.35	0.000	2	
	X	50.00D	1.35	0.000	2	
		100.00D	.23	0.000	2	
		150.00D	.23	0.000	2	
		200.00D	.23	0.000	2	
	No transformation		0.00D	1.00	0.000	2
			1.56D	1.00	0.000	2
			3.13D	1.00	0.000	2
		6.25D	1.00	0.000	2	
		12.50D	1.00	0.000	2	
		25.00D	1.00	0.000	2	
		50.00D	1.00	0.000	2	
		100.00D	0.00	0.000	2	
		150.00D	0.00	0.000	2	
	200.00D	0.00	0.000	2		

Error occurred during statistics:

No variation in the data