6-2-94

DATA EVALUATION RECORD

1. CHEMICAL: Endothall

2. TEST MATERIAL: Endothall Technical 91.21%

3. STUDY TYPE: §72-3 96 Hour LC_{50} for *Mysidopsis bahia*

4. CITATION:

Author: Bettencourt, Michael J.
Title: Endothall Technical - Acute Toxicity To Mysid Shrimp (*Mysidopsis bahia)*
Date: 8/10/93
Laboratory Report #:93-3-4711
Any Other Study #:12442.0591.6124.515
Sponsor:Atochem North America
Laboratory:Springborn Laboratories, Inc.
MRID No.: 42914101

5. REVIEWED BY:

Dennis J. McLane, Wildlife Biologist Signature: Dennis McLane
Ecological Effects Branch
Environmental Fate and Effects Division (H7507 C) Date: 5-12-94

6. APPROVED BY:

Les Touart, Chief, Section 1 Signature: L C Touart
Ecological Effects Branch
Environmental Fate and Effects Division (H7507C) Date: 6-2-94

7. CONCLUSION This study meets the guideline requirements. The mysid 96 hour LC_{50} is 39 (29-64)mg/L. This places endothall technical in the slightly toxic category.

8. RECOMMENDATIONS N/A

9. BACKGROUND This study was submitted in support of endothall acid (technical) as required in the Reregistration DCI.

10. MATERIALS AND METHODS

A. Test Organisms:

Guideline Criteria	Reported Information
Species (Scientific Name)	*Mysidopsis bahia*
All organisms should be approximately the same size and weight.	Not reported

Juvenile organisms should be used. Mysids ≤24hrs @ beginning	Yes
Supplier	SLI culture
Check for signs of disease or injury (yes or no, if yes describe)	Not reported
If diseased it can be treated in 48-hr pretest no sign of the disease remains (Report hours prior to test in which no sign of disease or N/A)	Not reported
<3% mortality 48 hours prior to testing (% mortality, if any)	Health prior to study not reported.
Other Comments	None

B. Source/Acclimation

Guideline Criteria	Reported Information
All organisms from same source (yes or no)	Yes
After collection 10 days for observation & acclimation	N/A
Acclimation Period (minimum 2 days same temp. & water quality)	Not reported
Mysid require feeding & must be fed during the test.	Live brine shrimp were added to each retention chamber containing live test organisms twice daily during the exposure period.
Other Comments	None

C. Test Solution:

Guideline Criteria	Reported Information

Describe source of dilution water (prefer soft reconstituted water)	From Cape Cod Canal, Bourne, Massachusetts, filtered with 20 and 5 micron polypropylene core filters, heat exchanger, Also tested for pesticides, PBC's, and toxic metals.
Does water support test animals without observable signs of stress?	Yes
Salinity - 30 to 34‰ (stenohaline); - 10 to 17‰ (estuarine)	31-32‰
pH - 8.0 to 8.3 (stenohaline) - 7.7 to 8.0 (estuarine)	pH 7.8 - 8.0
Temperature - 22°C±1°C;	25°C
Other Comments	None

D. Test System:

Test Aquaria 1. Material (glass or stainless steel) 2. a. Small organisms (3.9 L (1 gal) with 2 to 3 L solution) b. Large organisms ≥0.5 g 19.6 L vessel; 15 L solution	19.5 L glass aquaria; 7 to 11 L
Photoperiod (16 L & 8 D)	16 hours of light and 8 hours of dark; intensity 20 - 100 footcandles
Biomass Loading Rate (Static no > 0.8 g/L ≤ 17°C; >17°C 0.5g/L; Flow-through 1 g/L/24 & must not be >10 g/L at any time at or below 17°C or 5 g/L at higher temperatures.	0.00014 g of biomass per liter of flowing test solution per day
Solvents (Do not exceed 0.5 ml/L for any tests)	N/A

Type of Dilution System (reproducibly supply appropriate toxicant)	"A Harvard Perstalic pump was calibrated to deliver 1.0 mL/min of the Endothall Technical Stock solution (12.5 mg A.I./mL) to the diluter system's chemical mixing chamber, which also received 0.25 L/min of seawater. The mixing chamber was positioned over a magnetic stirrer which aided in the solubilization of the test material."
Flow rate Consistent flow rate-meter systems calibrated before study and checked 2*24 hours - 5 to 10 vol/24 hours	"The diluter was calibrated to deliver 50 mL/minute of exposure solution to each replicate aquarium, which provided approximately 6.5 volume replacements per aquarium every 24 hours."; "Calibrated prior to test initiation"; monitored daily and a visual check twice a day.
Other Comments	None

D. Test Design:

Guideline Criteria	Reported Information
Range Finding Test (LC_{50} >100 mg/L with 30 shrimp, no definitive test required.)	Mortality observed (90,20,20,and 10%) at four highest levels (50,30,18,and 11 mg A.I./L, respectively). No mortality
Definitive Test	
Nominal Concentrations (control+5 treatment levels; dosage should be 60% of the next highest concentration; concentrations should be geometric series)	Control and 6 treatment levels; 50, 30, 18, 11, 6.5, & 3.9
Number of Test Organisms; (Minimum 20/level can be divided among containers)	20 per treatment level and control, 5 per retention chamber

Controls (Minimum control mortality; static 10%; flow-through 5%	zero control mortality
All organisms must be randomly assigned to test vessels. (yes or no, describe if no)	"...impartially selected and distributed to each replicate..."
Sampling Schedule for Water Chemistry 1. Temperature - record every 6 hrs;>1°C. 2. D.O. beginning,48 hrs,end for control high, medium, and low dose. 2.a. 1st 48 hrs. >60%; 2nd 48 hrs >40% 3. pH beginning,48 hrs, end for control, high, medium, and low dose.	D.O. conc., pH, salinity and temperature were measured once daily in both replicates of each treatment level and the control. Temp. 24°C; D.O. 97%-114%; pH 6.7 -7.8
Chemical Analysis (needed if aeration, volatile, insoluble, precipitate, not steel or glass, known to adsorb, and flow-through) (yes or no)	Flow-through study
Other Comments	None

11. REPORTED RESULTS:

Guideline Criteria	Reported Information
Mean Measured Concentrations (report conc.)	Mean measured concentrations mg A.I./L 55, 28, 15, 8.3, 4.7, 2.5
Recovery of Chemical (% recovery)	50 mg/L 110%; 30 mg/L 93.3%; 18 mg/L 83.3%; 11 mg/L 75.5%; 6.5 mg/L 72.3%; 3.9 mg/L 64%
Mortality & Observations (Describe observations & attach mortality tables)	See attached copy of Table 3 from the study.
Author's Comments	None

12. STUDY AUTHOR'S CONCLUSIONS / QUALITY ASSURANCE MEASURES:

13. REVIEWER'S DISCUSSION AND INTERPRETATION

A. Test Procedure:

The following items did not meet the guideline criteria:

1. Did not report that all organisms are the same size and weight.

2. Did not indicate that all organism were checked for disease or injury.

3. Did not report that for a minimum of 2 days prior to temperature and water quality were the same as the actual test conditions

4. Less than 3% mortality 48 hours prior to testing (% mortality, if any) not addressed in the study.

5. The report did not say that the mysid were randomly assigned to each replicate but, "...impartially selected and distributed to each replicate...".

6. Temperature was only measured once every 24 hours rather than once every 6 hours.

7. The temperature was 24°C rather than 22°C.

8. The pH was 7.8-8.0 rather than 8.0-8.3.

B. Statistical Analysis

Guideline Criteria	Reported Information
Binomial (yes, no, or not reported)	No
Moving Average Angle (yes, no, or not reported)	No
Probit (yes, no, or not reported)	Yes, the reported 96 LC_{50} is 39 (29-64) mg/L
Other Comments	The reported probit slope value is 2.8236. The EEB LC_{50} probit value is 39.4 (29 - 64) and the slope was 2.4622.

C. Discussion/Results: This LC_{50} value places endothall in the slightly toxic range. The deviations mentioned in A. Test Procedures are not expected to dramatically change the LC_{50} provided by this study.

D. Adequacy of the Study:

1. Classification: Core

2. Rational: The study meets the intent of the guidelines.

3. Reparability: N/A

14. COMPLETION DATE OF ONE-LINER FOR STUDY: Yes 5/12/94

MCLANE ENDOTHALL MYSID 96 HOUR ACUTE

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CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB. (PERCENT)
55	20	14	70	5.765915
28	20	5	25	2.069473
15	20	3	15	.1288414
8.3	20	2	10	2.012253E-02
4.7	20	0	0	9.536742E-05
2.8	20	0	0	9.536742E-05

THE BINOMIAL TEST SHOWS THAT 28 AND +INFINITY CAN BE USED AS STATISTICALLY SOUND CONSERVATIVE 95 PERCENT CONFIDENCE LIMITS, BECAUSE THE ACTUAL CONFIDENCE LEVEL ASSOCIATED WITH THESE LIMITS IS GREATER THAN 95 PERCENT.

AN APPROXIMATE LC50 FOR THIS SET OF DATA IS 40.85146

RESULTS CALCULATED USING THE MOVING AVERAGE METHOD

SPAN	G	LC50	95 PERCENT CONFIDENCE LIMITS	
1	.4747721	40.85146	30.60053	58.64469

RESULTS CALCULATED USING THE PROBIT METHOD

ITERATIONS	G	H	GOODNESS OF FIT PROBABILITY
3	.1542306	1	.5923001

SLOPE = 2.462247

95 PERCENT CONFIDENCE LIMITS = 1.495268 AND 3.429226

LC50 = 39.43157

95 PERCENT CONFIDENCE LIMITS = 29.12364 AND 64.14254

LC10 = 12.02417

95 PERCENT CONFIDENCE LIMITS = 6.769146 AND 16.64048

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____ Identity of product impurities.

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____ Description of quality control procedures.

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____ Sales or other commercial/financial information.

____ A draft product label.

____ The product confidential statement of formula.

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