

US EPA ARCHIVE DOCUMENT

EEB 9-12-94
files

MRID No: 43212701

DATA EVALUATION RECORD

- 1. CHEMICAL: Triphenyltin Hydroxide (TPTH)
- 2. TEST MATERIAL: Triphenyltin (TPTH) Technical, Lot#RFRAM909K
Purity: 97.23%
- 3. STUDY TYPE: §72-3 (c) Acute toxicity test for estuarine and marine organisms: Mysid Shrimp (*Mysidopsis bahia*)

4. CITATION:

Author: Machado, M. W.
 Title: Triphenyltin (TPTH) - Acute Toxicity to Mysid Shrimp (*Mysidopsis bahia*) under Flow-Through Conditions
 Date: March 10, 1994
 Laboratory Report #: 94-1-5124
 Any Other Study #: 11117.0593.6103.515
 Sponsor: Griffin Corp. Valdosta, GA
 Sponsor #: N/A
 Laboratory: Springborn Laboratories, Inc.
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5. REVIEWED BY:

Dennis J. McLane, Wildlife Biologist Signature: *Dennis J. McLane*
 Ecological Effects Branch
 Environmental Fate and Effects Division (7507 C) Date: 8-26-94

6. APPROVED BY:

Les Touart, Chief, Section 1 Signature: *L. Touart*
 Ecological Effects Branch
 Environmental Fate and Effects Division (7507C) Date: 9-12-94

7. CONCLUSION This study fulfills the guideline requirements. The reported moving average angle was 4.3 (3.7-5.0) µg/L which will place TPTH in the very highly toxic category (<100 µg/L).

8. RECOMMENDATIONS N/A

9. BACKGROUND Submitted in response to the list A process.

10. MATERIALS AND METHODS

A. Test Organisms: Mysid Shrimp

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Guideline Criteria	Reported Information
Species (Scientific Name)	<i>Mysidopsis bahia</i>
Mean Weight (> 0.5 grams)	0.001 g
Supplier	Springborn Laboratories
All shrimp from same source (yes or no)	yes
All shrimp from the same year class (yes or no)	yes ≤24 hours old
Other Comments	

B. Source/Acclimation

Guideline Criteria	Reported Information
Acclimation Period (minimum 10 days)	Cultured at this laboratory
Wild caught 7 day quarantine (yes or no)	no
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)	N/A
No feeding during the study (When last fed)	twice daily
<3% mortality 48 hours prior to testing (% mortality, if any)	Not reported

C. Test System:

Guideline Criteria	Reported Information
Describe source of dilution water	Cape Cod Canal, Bourne, Massachusetts

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Does water support test animals without observable signs of stress?	Yes
What was the salinity of the water used? (30-34% ppt for marine (stenohaline) shrimp and 10-17% ppt for estuarine (euryhaline) shrimp.	3‰
Water Temperature (22°C)	25°C
pH 8.0-8.3 marine (stenohaline) shrimp 7.7-8.0 estuarine (euryhaline) shrimp	7.7-8.0
Dissolved Oxygen (Static 1 st 48 hrs 40%; 2 nd 48 hrs 60%; Flow-through 60%) (% of lowest conc. & hour)	90-103%
Total Organic Carbon	1.1-1.5 mg/l
Test Aquaria 1. Material (glass or stainless steel) 2. a. Static volume (18.9 L (5 gal or 19000 cc) with 15 L solution) b. Static or flow-through volume (300x600x300 = 54000 cc.)	1. glass and silicone sealant a. N/A b. 39 x 20 x 25 cm depth limited by a 14.5 cm standpipe for a volume of 11 L
Type of Dilution System (Reproducible supply of toxicant)	modified serial diluter system
Flow rate Consistent flow rate-meter systems calibrated before study and checked 2*24 hours - 5 to 10 vol/24 hours	6.5 volume replacements per aquarium every 24 hours

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Biomass Loading Rate (Static no > 0.8 g/L ≤ 17°C; >17°C 0.5 g/L; Flow-through 1 g/L/24)	0.00014 g
Photoperiod (16 L & 8 D)	16 L & 8 D
Solvents 1. (Do not exceed 0.5 ml/L for static tests) 2. (Do not exceed 0.1 ml/L for flow-through)	1. N/A 2. 0.1 ml/L
Other Comments	

D. Test Design:

Guideline Criteria	Reported Information
<u>Range Finding Test</u> (LC ₅₀ >100 mg/L with 30 shrimp, no definitive test required.)	Mortality at 11 µg/L
<u>Definitive Test</u>	
Nominal Concentrations (control+5 treatment levels; dosage should be 60% of the next highest concentration; concentrations should be geometric series)	control, solvent control, 1.6, 2.6, 4, 3, 7.2, and 12 µg/L
Controls (Minimum control mortality; static 10%; flow-through 5%)	0% mortality for both control and solvent control
Number of Test Organisms; (Minimum 20/level can be divided among containers)	20/level
All organisms must be randomly assigned to test vessels. (yes or no, describe if no)	"impartially selected and distributed"
Biological Observations (yes or no)	Yes

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<p>Water Parameter Measurements</p> <p>1. Temperature - record every 6 hrs; >1°C.</p> <p>2. D.O. beginning, 48 hrs, end for control high, medium, and low dose.</p> <p>3. pH beginning, 48 hrs; end for control, high, medium, and low dose.</p>	<p>1. Continuous in replicate A range 24-25°C, others were daily and 25°C</p> <p>2. daily in each aquarium</p> <p>3. daily in each aquarium</p>
<p>Chemical Analysis (needed if aeration, volatile, insoluble, precipitate, not steel or glass, known to adsorb, and flow-through) (yes)</p>	<p>yes</p>
<p>Other Comments</p>	

11. REPORTED RESULTS:

Guideline Criteria	Reported Information
Mean Measured Concentrations (report conc.)	1.4, 2.2, 3.8, 6.3, 10
Recovery of Chemical (% recovery)	90, 83, 89, 88, 87
Mortality & Observations (Describe observations & attach mortality tables)	See attached Table 3 for both mortality and observations
Author's Comments	

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

Author provided no conclusions. Quality assurance unit statement was provided and signed by the Patricia D. Royal the Regulatory Affairs and Quality Assurance Manager. Also a good laboratory practice compliance statement was include with signature from the Study director, Sponsor study monitor, and Applicant/Submitter.

13. REVIEWER'S DISCUSSION AND INTERPRETATION

A. Test Procedure:

The following items did not meet the guideline

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criteria:

1. Rather than randomly assigned to test vessels the shrimp were "impartially selected and distributed to test vessels.
2. Disease in the shrimp was not discussed.
3. The percent mortality 48 prior to the test was not reported.

B. Statistical Analysis

Guideline Criteria	Reported Information
Binomial (yes, no, or not reported)	No
Moving Average Angle (yes, no, or not reported)	Yes, 4.3 (3.7-5.0) $\mu\text{g/L}$
Probit (yes, no, or not reported)	No
Other Comments --	EEB used the Toxanal program which gives LC_{50} values from binomial, moving average, and probit methods. They were as follows: binomial 4.7 (3.8-6.3) $\mu\text{g/L}$, moving average 4.57 (3.96-5.336) $\mu\text{g/L}$, and probit 4.74 (4.26-5.31) $\mu\text{g/L}$. (see attached printout).

C. Discussion/Results: The items under 13. REVIEWER'S DISCUSSION AND INTERPRETATION are not expected in this case to effect the results of the study.

D. Adequacy of the Study:

1. Classification: Core
2. Rational: Fulfills guideline requirements.
3. Reparability: N/A

14. COMPLETION DATE OF ONE-LINER FOR STUDY:

MCLANE TPTH MYSID 96-HOUR FLOW-THROUGH ACUTE

CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB. (PERCENT)
10	20	20	100	9.536742E-05
6.3	20	19	95	2.002716E-03
3.8	20	2	10	2.012253E-02
2.2	20	0	0	9.536742E-05
1.4	20	0	0	9.536742E-05

THE BINOMIAL TEST SHOWS THAT 3.8 AND 6.3 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 4.785323

RESULTS CALCULATED USING THE MOVING AVERAGE METHOD

SPAN	G	LC50	95 PERCENT CONFIDENCE LIMITS	
4	4.557268E-02		4.573244	3.968218
5.360389				

RESULTS CALCULATED USING THE PROBIT METHOD

ITERATIONS	G	H
6	.1649973	1
.9999995		

SLOPE = 13.33154
 95 PERCENT CONFIDENCE LIMITS = 7.91629 AND 18.7468

LC50 = 4.74165
 95 PERCENT CONFIDENCE LIMITS = 4.263238 AND 5.318471

LC10 = 3.807736
 95 PERCENT CONFIDENCE LIMITS = 3.163379 AND 4.238397
