9-12-94

MRID No.: 43212702

DATA EVALUATION RECORD

1. CHEMICAL: Triphenyltin Hydroxide (TPTH)

2. TEST MATERIAL: 97.23% TGAI, white powder

3. STUDY TYPE: §72-3 Estuarine Fish 96-hour Acute Toxicity Test.

4. CITATION:

Author:	Mark W. Machado
Title:	Triphenyltin Hydroxide (TPTH)-Acute Toxicity to Sheephead Minnow (*Cyprinodon variegatus*) under Flow-Through Conditions
Date:	March 15, 1994
Laboratory Report #:	93-10-4952
Any Other Study #:	11117.0593.6102.505
Sponsor:	Griffin Corp.
Sponsor #:	N/A
Laboratory:	Springborn Laboratories, Inc.
MRID No.:	43212702

5. REVIEWED BY:

Dennis J. McLane, Wildlife Biologist Signature: Dennis 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 for an acute toxicity test using sheepshead minnows. Under the conditions of the test, the 96-hour LC_{50} was 25.5 (21-33) µg ai/L, which classifies TPTH as very highly toxic to sheepshead minnows.

8. RECOMMENDATIONS N/A

9. BACKGROUND Submitted in response to list A process.

1/88

MRID No.: 43212702

10. MATERIALS AND METHODS

A. Test Organisms: Sheepshead minnow

Guideline Criteria	Reported Information
Species (Scientific Name)	*Cyprinodon variegatus*
Mean Weight (0.5-5 grams)	0.28 (0.20-0.34) grams
Mean Length(S.L. longest not > 2x shortest	26 (22-32) mm
Supplier	Aquatic Biosystems
All fish from same source (yes or no)	yes
All fish from the same year class (yes or no)	Not reported
Other Comments	

B. Source/Acclimation

Guideline Criteria	Reported Information
Acclimation Period (minimum 14 days)	14 days
Wild caught 7 day quarantine (yes or no)	no
Check for signs of disease or injury (yes or no, if yes describe)	no, only checked for mortality
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)	no mortality in fish 48 hours prior to start of the test.
No feeding during the study (When last fed)	48 hours prior to testing.
<3% mortality 48 hours prior to testing (% mortality, if any)	0% mortality prior to testing.

C. Test System:

Guideline Criteria	Reported Information
Describe source of dilution water (prefer soft reconstituted water)	Collected from Cape Cod Canal, Bourne, MA.Seawater was then passed through a series of polypropylene core filters & then recirculated within an epoxy-lined concrete reservoir prior to use.
Does water support test animals without observable signs of stress?	yes
Salinity of water used. (reconstituted seawater of 30-34% salinity) (weekly range of salinity is less than 6%)	31-32‰
Water Temperature (22 ± 1)	22 ± 1
pH (8.0-8.3 for marine-stenohaline fish and 7.7-8.0 for estuarine-euryhaline fish species) (monthly range is less than 0.8 of a pH unit)	7.7-8.0
Dissolved Oxygen (Static 1st 48 hrs 40%; 2nd 48 hrs 60%; Flow-through 60%) (% of lowest conc. & hour)	>71% in all test and controls vessels over 96 hours of testing.
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. each glass test aquaria and silicone sealant a. N/A b. measured 39X20X25 cm with a 14.5 cm standpipe to maintain a volume of 11 L.
Type of Dilution System (Reproducible supply of toxicant)	flow-through, reproducible.

Flow rate 1. Consistent flow rate-meter systems calibrated before study 2. Checked 2*24 hours - 5 to 10 vol/24 hours	1. Tested and verified 6 days and 2 days prior to start of the test. 2. Monitored daily and checked twice visually each day. Flow of exposure to each test aquarium was approx. 50 ml/min, which equaled approx. 6.5 volume replacements per 24 hours per aquarium.
Biomass Loading Rate (Static no > 0.8 g/L ≤ 17°C; >17°C 0.5g/L; Flow-through 1 g/L/24	0.039 g of biomass/L of flowing test solution per day.
Photoperiod (16 L & 8 D)	16 hours light, 8 hours dark.
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. 0.092 ml/L
Other Comments	

D. Test Design:

Guideline Criteria	Reported Information
Range Finding Test (LC_{50} >100 mg/L with 30 fish, no definitive test required.)	13, 36, 100µg a.i./L 100% mortality @ 36 and 100 µg/L levels and no effects seen @ the 13 µg/L level.
Definitive Test	
Nominal Concentrations (control+5 treatment levels; dosage should be 60% of the next highest concentration; concentrations should be geometric series)	13, 22, 36, 60, 100 µg ai/L + control and solvent control. Dosage levels were 60% of the next highest level.
Controls (Minimum control mortality; static 10%; flow-through 5%	0% mortality observed in the solvent control and control.

Number of Test Organisms; (Minimum 10/level can be divided among containers)	20 fish (10 per test aquaria) per concentration and controls were used. 140 fish total.
All organisms must be randomly assigned to test vessels. (yes or no, describe if no)	impartially selected.
Biological Observations (yes or no)	yes, at test initiation and every 24 hours.
Water Parameter Measurements 1. Temperature - record every 6 hrs;>1°C. 2. D.O. beginning,48 hrs,end for control high, medium, and low dose. 3. pH beginning,48 hrs, end for control, high, medium, and low dose.	recorded continuously in one control aquaria. pH, temperature, and DO were measured in each replicate vessel once daily throughout exposure period.
Chemical Analysis (needed if aeration, volatile, insoluble, precipitate, not steel or glass, known to adsorb, and flow-through) (yes or no)	yes, sample from each replicate solution of high, medium, and low treatment levels and dilution water control were taken twice prior to definitive test. In addition, water samples were taken both replicate test solutions of each treatment level and the controls at 0-hour and 96 -hours of exposure for analysis.
Other Comments	

11. REPORTED RESULTS:

Guideline Criteria	Reported Information
Mean Measured Concentrations (report conc.)	16, 21, 33, 61, 110 µg ai/L
Recovery of Chemical (% recovery)	104% of nominal concentrations
Mortality & Observations (Describe observations & attach mortality tables)	See attached Table 3.

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 criteria:

1. Study fish weighed less than what is generally recommended (0.12-0.56), should be between 0.5-5.0 grams.

2. Small amount of precipitate was observed in the mixing chamber of diluter system, however analyticl data indicates the test concentrations were maintained to be 81% on nominal.

B. Statistical Analysis

Guideline Criteria	Reported Information
Binomial (yes, no, or not reported)	yes, 96-hour LC_{50} = 26 (C.I. 21 - 33) µg ai/L
Moving Average Angle (yes, no, or not reported)	no
Probit (yes, no, or not reported)	no
Other Comments	The EEB Toxanal program indicates that the binomial is correct 25.55 (21-33) µg/L. (See the attached printout)

C. Discussion/Results:

This study is scientifically sound and fulfills the guideline requirements for an acute toxicity test using sheepshead.

minnows. Under the conditions of the test, the 96-hour LC_{50} was 25.5 μg ai/L, which classifies TPTH as very highly toxic to sheepshead minnows.

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:

MCALNE TPTH SHEEPSHEAD MINNOW 96 LC50

****

CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB. (PERCENT)
110	20	20	100	9.536742E-05
61	20	20	100	9.536742E-05
33	20	20	100	9.536742E-05
21	20	1	5	2.002716E-03
16	20	0	0	9.536742E-05

THE BINOMIAL TEST SHOWS THAT 21 AND 33 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 25.55475

WHEN THERE ARE LESS THAN TWO CONCENTRATIONS AT WHICH THE PERCENT DEAD IS BETWEEN 0 AND 100, NEITHER THE MOVING AVERAGE NOR THE PROBIT METHOD CAN GIVE ANY STATISTICALLY SOUND RESULTS.

****