

US EPA ARCHIVE DOCUMENT

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MRID No. 448065-04

DATA EVALUATION RECORD
§ 72-3 - ACUTE LC₅₀ TEST WITH AN ESTUARINE/MARINE FISH

1. **CHEMICAL:** Captan PC Code No.: 081301
2. **TEST MATERIAL:** Captan technical Purity: 99.8%
3. **CITATION:**
Authors: K.R. Drottar and H.O. Krueger
Title: Captan: A 96-Hour Static Acute Toxicity Test with the Sheepshead Minnow (*Cyprinodon variegatus*)
Study Completion Date: April 14, 1999
Laboratory: Wildlife International Ltd., Easton, MD
Sponsor: Captan Stewardship Task Force, Tomen Agro, Inc., San Francisco, CA and Makhteshim-Agan of North America, Inc., New York, NY
Laboratory Report ID: 493A-104
MRID No.: 448065-04
DP Barcode: D255807


4. **REVIEWED BY:** Mark Mossler, M.S., Environmental Scientist, Golder Associates Inc.

Signature:  **Date:** 9/27/99

APPROVED BY: Pim Kosalwat, Ph.D., Senior Scientist, Golder Associates Inc.

Signature: P. Kosalwat **Date:** 9/27/99

5. **APPROVED BY:**

Signature:  **Date:** 10/29/99

6. **STUDY PARAMETERS:**

Age or Size of Test Organism: 16-21 mm
Definitive Test Duration: 96 hours
Study Method: Static
Type of Concentrations: Initial measured

7. **CONCLUSIONS:** This study is scientifically sound and fulfills the guideline requirements for an acute toxicity test using an estuarine fish. Based on initial measured concentrations, the 96-hour LC₅₀ was determined to be 1.9 ppm ai, which classifies captan as moderately toxic to the sheepshead minnow. The NOEC was determined to be 1.0 ppm ai.

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8. ADEQUACY OF THE STUDY:

A. Classification: Core

B. Rationale: N/A

C. Repairability: N/A

9. GUIDELINE DEVIATIONS: No deviations were noted.**10. SUBMISSION PURPOSE:****11. MATERIALS AND METHODS:****A. Test Organisms**

Guideline Criteria	Reported Information
<u>Species</u> Preferred species are the sheepshead minnow (<i>Cyprinodon variegatus</i>) or the silverside (<i>Menidia</i> spp.).	<i>Cyprinodon variegatus</i>
<u>Mean Weight</u> 0.1-5 g	Mean: 0.15 g Range: 0.083 - 0.30 g
<u>Mean Standard Length</u> Longest not > 2x shortest	Mean: 17 mm Range: 16 - 21 mm
<u>Supplier</u>	Chesapeake Cultures, Hayes, VA
All fish from same source?	Yes
All fish from the same year class?	Yes

B. Source/Acclimation

Guideline Criteria	Reported Information
<u>Acclimation Period</u> Minimum 7 days	18 days
Wild caught organisms were quarantined for 7 days?	N/A
Were there signs of disease or injury?	No

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Guideline Criteria	Reported Information
If treated for disease, was there no sign of the disease remaining during the 48 hours prior to testing?	N/A
Feeding No feeding during the study	Not fed 52 hours prior to or during testing
Pretest Mortality < 3% mortality 48 hours prior to testing	Not reported

C. Test System

Guideline Criteria	Reported Information
Source of dilution water Reconstituted seawater or seawater from a natural source.	Natural seawater pumped from Indian River Inlet, DE, diluted to a salinity of approximately 20‰ with well water, filtered, and aerated
Does water support test animals without observable signs of stress?	Yes
Salinity Weekly range should not deviate by more than 6‰.	20‰
Water Temperature 22°C	21.0 - 22.0°C
pH Monthly range must not deviate by more than 0.8 unit. Euryhaline: 7.7-8.0 Stenohaline: 8.0-8.3	8.0 - 8.2
Dissolved Oxygen Static: ≥ 60% during 1 st 48 hrs and ≥ 40% during 2 nd 48 hrs, flow-through: ≥ 60%	≥77% throughout test

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Guideline Criteria	Reported Information
Test Aquaria 1. Material: Glass or stainless steel 2. Size: Volume of 18.9 L (5 gal) or 30 x 60 x 30 cm 3. Fill volume: 15-30 L of solution	Glass 38 L 10 L
Type of Dilution System Must provide reproducible supply of toxicant	N/A
Flow Rate Consistent flow rate of 5-10 vol/24 hours, meter systems calibrated before study and checked twice daily during test period	N/A
Biomass Loading Rate Static: ≤ 0.8 g/L at $\leq 17^{\circ}\text{C}$, ≤ 0.5 g/L at $> 17^{\circ}\text{C}$; flow- through: ≤ 1 g/L/day	0.15 g/L
Photoperiod 16 hours light, 8 hours dark	16 hours light, 8 hours dark
Solvents Not to exceed 0.5 mL/L for static tests or 0.1 mL/L for flow-through tests	DMF (0.5 mL/L)

D. Test Design

Guideline Criteria	Reported Information
Range Finding Test If $\text{LC}_{50} > 100$ mg/L with 30 fish, then no definitive test is required.	An exploratory range finding toxicity test was conducted; results were not reported.

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Guideline Criteria	Reported Information
<p><u>Nominal Concentrations of Definitive Test</u> Control & 5 treatment levels; dosage should be 60% of the next highest concentration; concentrations should be in a geometric series</p>	Control, solvent control, 0.52, 0.86, 1.4, 2.4, and 4.0 mg ai/L
<p><u>Number of Test Organisms</u> Minimum 10/level for static test, 20/level for flow-through, may be divided among containers</p>	10 per replicate, 20 per treatment level
<p>Test organisms randomly or impartially assigned to test vessels?</p>	Yes
<p>Biological observations made every 24 hours?</p>	Yes
<p><u>Water Parameter Measurements</u> 1. <u>Temperature</u> Measured constantly or, if water baths are used, every 6 hrs, may not vary > 1°C 2. <u>DO and pH</u> Measured at beginning of test and ever 48 h in the high, medium, and low doses and in the control</p>	<p>1. Temperature was measured at test initiation and termination in each test chamber and continuously in one negative control replicate.</p> <p>2. DO and pH were measured every 24 hours in each replicate test chamber.</p>
<p><u>Chemical Analysis</u> Needed if solutions were aerated, if chemical was volatile, insoluble, or known to absorb, if precipitate formed, if containers were not steel or glass, or if flow-through system was used</p>	Yes, solutions were collected for analysis from each replicate at test initiation and analyzed by GC

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12. REPORTED RESULTS:**A. General Results**

Guideline Criteria	Reported Information
Quality assurance and GLP compliance statements were included in the report?	Yes
Recovery of Chemical Percent of nominal, procedural recovery, limit of quantitation (LOQ)	68-85% of nominal, 89.7% procedural recovery, LOQ = 0.25 ppm
Control Mortality Not more than 10% control organisms may die or show abnormal behavior.	0% mortality in both control groups
Raw data included?	Yes
Signs of toxicity (if any) were described?	No signs of toxicity were observed

Mortality

Concentration (mg ai/L)		Number of Fish	Cumulative Number Dead			
Nominal	Initial Measured*		Hour of Study			
			24	48	72	96
Control	<LOQ	20	0	0	0	0
Solvent Control	<LOQ	20	0	0	0	0
0.52	0.43	20	0	0	0	0
0.86	0.60	20	0	0	0	0
1.4	1.0	20	0	0	0	0
2.4	1.7	20	6	6	7	7
4.0	3.1	20	18	18	19	19

*Initial measured concentrations were not corrected for a procedural recovery of 89.7%.

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Other Significant Results: No sublethal signs of test material toxicity were observed.

B. Statistical Results

Method: probit analysis

96-hr LC ₅₀ : 1.9 ppm ai	95% C.I.: 1.7-2.2 ppm ai
Probit Slope: 8.4	NOEC: 1.0 ppm ai

13. VERIFICATION OF STATISTICAL RESULTS:

Method: probit analysis

96-hr LC ₅₀ : 1.9 ppm ai	95% C.I.: 1.8-2.0 ppm ai
Probit Slope: 8.4	NOEC: 1.0 ppm ai

- 14. REVIEWER'S COMMENTS:** This study is scientifically sound and fulfills the guideline requirements for an acute toxicity test using an estuarine fish. Based on initial measured concentrations, the 96-hour LC₅₀ of 1.9 ppm ai classifies captan as moderately toxic to the sheepshead minnow. The NOEC was determined to be 1.0 ppm ai. This study is classified as **Core**.

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Sheepshead minnow mortality - probit

Conc.	Number Exposed	Number Resp.	Observed Proportion Responding	Adjusted Proportion Responding	Predicted Proportion Responding
1.0000	100	0	0.0000	0.0000	0.0083
1.7000	100	35	0.3500	0.3500	0.3239
3.1000	100	95	0.9500	0.9500	0.9590

Chi - Square Heterogeneity = 1.352

Mu = 0.284733
 Sigma = 0.118811

Parameter	Estimate	Std. Err.	95% Confidence Limits	
Intercept	2.603477	0.248193	(2.117019,	3.089934)
Slope	8.416730	0.814510	(6.820290,	10.013169)

Theoretical Spontaneous Response Rate = 0.0000

Sheepshead minnow mortality

Estimated EC Values and Confidence Limits

Point	Conc.	Lower 95% Confidence	Upper Limits
EC 1.00	1.0194	0.8713	1.1395
EC 5.00	1.2283	1.0911	1.3395
EC10.00	1.3566	1.2282	1.4626
EC15.00	1.4508	1.3288	1.5536
EC50.00	1.9263	1.8168	2.0463
EC85.00	2.5578	2.3770	2.8164
EC90.00	2.7353	2.5233	3.0493
EC95.00	3.0211	2.7531	3.4348
EC99.00	3.6402	3.2341	4.3044



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HED File Code: 61400 SRRD DERs
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HED Records Reference Center
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