US EPA ARCHIVE DOCUMENT

DATA EVALUATION RECORD
§ 72-1 - ACUTE LC_{50} TEST WITH A COLDWATER FISH

1. **CHEMICAL:** Suttocide A **PC Code No.:** 128972

2. **TEST MATERIAL:** Sodium Hydroxymethylglycinate **Purity:** 49.53%

3. **CITATION:**

Authors: W.C. Graves and J.P. Swigert
Title: Suttocide A (Integra 44): A 96-Hour Flow-Through Acute Toxicity Test with the Rainbow Trout (*Oncorhynchus mykiss*)
Study Completion Date: August 23, 1996
Laboratory: Wildlife International Ltd., Easton, MD
Sponsor: ISP Sutton Laboratories, Chatham, NJ
Laboratory Report ID: 300A-107
MRID No.: 441058-02
DP Barcode: D230022 & D230023

4. **REVIEWED BY:** Mark Mossler, M.S., Toxicologist, KBN Engineering and Applied Sciences, Inc.,

Signature: Mark L. Mossler **Date:** 6/18/97

APPROVED BY: Pim Kosalwat, Ph.D., Senior Scientist, KBN Engineering and Applied Sciences, Inc.,

Signature: P. Kosalwat **Date:** 6/18/97

5. **APPROVED BY:** Allen W. Vaughan 6/27/97 H Curr 01/06/98

Signature: **Date:**

6. **STUDY PARAMETERS:**

Age or Size of Test Organism: 24-27 mm
Definitive Test Duration: 96 hours
Study Method: Flow-through
Type of Concentrations: Mean measured

7. **CONCLUSIONS:** This study is scientifically sound and fulfills the guideline requirements. A 96-hour LC_{50} of 106 ppm ai classifies Suttocide A as practically non-toxic to the trout.

Results Synopsis:

LC_{50}: 106 ppm ai 95% C.I.: 90 - 130 ppm ai
NOEC: 35 ppm ai Probit Slope: 7.1

8. **ADEQUACY OF THE STUDY:**

   A. **Classification:** Core for a formulated product.

   B. **Rationale:** N/A.

   C. **Repairability:** N/A.

9. **GUIDELINE DEVIATIONS:** The pH of the test solutions (up to 9.4) was greater than recommended (7.2-7.6).

10. **SUBMISSION PURPOSE:**

11. **MATERIALS AND METHODS:**

   A. **Test Organisms**

Guideline Criteria	Reported Information
Species Preferred species is the rainbow trout (*Oncorhynchus mykiss*)	*Oncorhynchus mykiss*
Mean Weight 0.5-5 g	0.25 g
Mean Standard Length Longest not > 2x shortest	Mean: 26 mm Range: 24-27 mm
Supplier	Troutlodge, Inc., Sumner, WA
All fish from same source?	Yes
All fish from the same year class?	Yes

   B. **Source/Acclimation**

Guideline Criteria	Reported Information
Acclimation Period Minimum 14 days	Held under similar conditions to testing for 35 days and under testing conditions for 51 hours prior to testing
Wild caught organisms were quarantined for 7 days?	N/A

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Guideline Criteria	Reported Information
Were there signs of disease or injury?	No signs of disease or stress
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	Last fed 48 hours prior to testing
Pretest Mortality < 3% mortality 48 hours prior to testing	Not reported

C. **Test System**

Guideline Criteria	Reported Information
Source of dilution water Soft reconstituted water or water from a natural source, not dechlorinated tap water	Moderately-hard well water, filtered and aerated
Does water support test animals without observable signs of stress?	Yes
Water Temperature 12°C	11.5-12.5°C
pH Prefer 7.2 to 7.6	8.3-9.4
Dissolved Oxygen Static: ≥ 60% during 1st 48 hrs and ≥ 40% during 2nd 48 hrs, flow-through: ≥ 60%	≥88% of saturation during the test
Total Hardness Prefer 40 to 200 mg/L as $CaCO_3$	132 mg/L as $CaCO_3$

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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	 Teflon®-lined polyethylene 25-L 15 L
Type of Dilution System Must provide reproducible supply of toxicant	Continuous-flow diluter
Flow Rate Consistent flow rate of 5-10 vol/24 hours, meter systems calibrated before study and checked twice daily during test period	6 volume replacements every 24 hours
Biomass Loading Rate Static: ≤ 0.8 g/L at ≤ 17°C, ≤ 0.5 g/L at > 17°C; flow-through: ≤ 1 g/L/day	0.028 g/L/day
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	Solvent: none Maximum conc.: N/A

D. **Test Design**

Guideline Criteria	Reported Information
Range Finding Test If LC_{50} >100 mg/L with 30 fish, then no definitive test is required.	Yes, but results were not reported

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Guideline Criteria	Reported Information
Nominal Concentrations of Definitive Test Control & 5 treatment levels; dosage should be 60% of the next highest concentration; concentrations should be in a geometric series	Control, 16, 26, 43, 72, and 120 mg active ingredient (ai)/L
Number of Test Organisms Minimum 10/level, may be divided among containers	20, 10 per replicate
Test organisms randomly or impartially assigned to test vessels?	Yes
Biological observations made every 24 hours?	Yes
Water Parameter Measurements 1. Temperature Measured constantly or, if water baths are used, every 6 hrs, may not vary > 1°C 2. DO and pH Measured at beginning of test and ever 48 h in the high, medium, and low doses and in the control	Temperature measured constantly in one negative control chamber and at test initiation and termination in each test chamber DO and pH measured daily in alternating chambers that contained live fish
Chemical Analysis 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	Samples were collected from one replicate chamber at 0, 48, and 96 hours after test initiation and analyzed using HPLC coupled with pulsed electrochemical detection.

12. REPORTED RESULTS:

A. General Results

Guideline Criteria	Reported Information
Quality assurance and GLP compliance statements were included in the report?	Yes

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Guideline Criteria	Reported Information
Recovery of Chemical	71-100%
Control Mortality Not more than 10% control organisms may die or show abnormal behavior.	0% mortality in the control group
Raw data included?	Yes
Signs of toxicity (if any) were described?	Yes

Mortality

Concentration (ppm ai)		Number of Fish	Cumulative Number Dead			
			Hour of Study			
Nominal	Mean Measured		24	48	72	96
Control	<0.26	20	0	0	0	0
16	11	20	0	0	0	0
26	21	20	0	0	0	0
43	35	20	0	0	0	0
72	62	20	0	1	1	1
120	120	20	4	6	6	13

Other Significant Results: Lethargy, surfacing, and discoloration were signs noted among fish exposed at the two highest-concentration exposure levels.

B. Statistical Results

Method: Probit

96-hr LC_{50}: 106 ppm ai
Probit Slope: Not reported

95% C.I.: 90 - 130 ppm ai
NOEC: 35 ppm ai

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13. VERIFICATION OF STATISTICAL RESULTS:

Parameter	Result
Binomial Test LC_{50} (C.I.)	104 (0 - ∞) ppm ai
Moving Average Angle LC_{50} (95% C.I.)	104 (89 - 134) ppm ai
Probit LC_{50} (95% C.I.)	106 (90 - 130) ppm ai
Probit Slope	7.1
NOEC	35 ppm ai

14. REVIEWER'S COMMENTS: This study is scientifically sound, fulfills the guideline requirements, and can be classified as **Core for a formulated product.** The 96-hour LC_{50} for rainbow trout exposed to Suttocide A was determined to be 106 ppm ai (214 ppm of whole product), which classifies this material as practically non-toxic to the rainbow trout.

Mossler Suttocide A Oncorhynchus mykiss 6-17-97

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CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB. (PERCENT)
120	20	13	65	13.1588
62	20	1	5	2.002716E-03
35	20	0	0	9.536742E-05
21	20	0	0	9.536742E-05
11	20	0	0	9.536742E-05

THE BINOMIAL TEST SHOWS THAT 0 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 103.87

RESULTS CALCULATED USING THE MOVING AVERAGE METHOD

SPAN	G	LC50	95 PERCENT CONFIDENCE LIMITS	
1	.2127723	103.87	89.12939	133.8395

RESULTS CALCULATED USING THE PROBIT METHOD

ITERATIONS	G	H	GOODNESS OF FIT PROBABILITY
11	.2672274	1	.9998336

SLOPE = 7.117801

95 PERCENT CONFIDENCE LIMITS = 3.438322 AND 10.79728

LC50 = 105.8812

95 PERCENT CONFIDENCE LIMITS = 89.72939 AND 130.2839

LC10 = 70.2091

95 PERCENT CONFIDENCE LIMITS = 45.32696 AND 84.03901

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