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

1. **CHEMICAL:** S-Dimethenamid — PC Code No.: 120051

2. **TEST MATERIAL:** SAN 1289H Technical — Purity: 91.9% (S-dimethenamid) 96.3% (tot. dimethenamid)

3. **CITATION:**

Author: William C. Graves and James P. Swigert
Title: SAN 1289H Technical: A 96-Hour Flow-Through Acute Toxicity Test With the Bluegill (*Lepomis macrochirus*)
Study Completion Date: June 4, 1996
Laboratory: Wildlife International Ltd., Easton, MD
Sponsor: Sandoz Agro, Inc., Des Plaines, IL
Laboratory Report ID: 131A-162
MRID No.: 443322-28
DP Barcode: D238350, D238356

4. **REVIEWED BY:** Karl Bullock, M.S., Associate Scientist, Golder Associates, Inc.

Signature: Karl Bullock **Date:** 10/21/97

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

Signature: P. Kosalwat **Date:** 10/21/97

5. **APPROVED BY:**

Signature: Joanne L. Edwards for Jim A. Bailey **Date:** 11/7/97 11/4/97

6. **STUDY PARAMETERS:**

Age or Size of Test Organism:	19-27 mm
Definitive Test Duration:	96 hours
Study Method:	Flow-through
Type of Concentrations:	Mean measured as total dimethenamid

7. **CONCLUSIONS:** This study is scientifically sound and fulfills the guideline requirements. The 96-hour LC_{50} for bluegill exposed to SAN 1289H technical was determined to be 10 ppm, which classifies this compound as moderately toxic to the bluegill. The NOEC was determined to be 4.1 ppm.

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Results Synopsis

LC_{50}: 10 ppm
NOEC: 4.1 ppm
95% C.I.: 7.5-12 ppm
Probit Slope: N/A

8. **ADEQUACY OF THE STUDY:**

   A. Classification: Core.

   B. Rationale: N/A.

   C. Repairability: N/A.

9. **GUIDELINE DEVIATIONS:** The pH was higher and the acclimation period was shorter than recommended. These deviations were not considered to affect the validity of the study.

10. **SUBMISSION PURPOSE:**

11. **MATERIALS AND METHODS:**

   A. Test Organisms

Guideline Criteria	Reported Information
Species Preferred species is the bluegill sunfish (*Lepomis macrochirus*)	*Lepomis macrochirus*
Mean Weight 0.1-5 g	0.29 g
Mean Standard Length Longest not > 2x shortest	Mean: 23 mm Range: 19-27 mm
Supplier	Northeastern Biologists, Inc., Rhinebeck, NY
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	51 hours
Wild caught organisms were quarantined for 7 days?	N/A
Were there signs of disease or injury?	No sickness or injury within the 14 days prior to testing
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 51 hours prior to testing
Pretest Mortality < 3% mortality 48 hours prior to testing	Pretest mortality 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	Well water, filtered and aerated before use.
Does water support test animals without observable signs of stress?	Yes
Water Temperature 17°C or 22°C	21.5-22.3°C
pH Prefer 7.2 to 7.6	8.2-8.4
Dissolved Oxygen Static: ≥ 60% during 1st 48 hrs and ≥ 40% during 2nd 48 hrs, flow-through: ≥ 60%	≥87% of saturation during the test
Total Hardness Prefer 40 to 200 mg/L as $CaCO_3$	136 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 vol/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	 0.032 g/L/day
Photoperiod 16 hours light, 8 hours dark	 16 h light, 8 h dark
Solvents Not to exceed 0.5 mL/L for static tests or 0.1 mL/L for flow-through tests	 Solvent: dimethylformamide Maximum conc.: 0.10 mL/L

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.	Nominal concentrations based on results of one experimental range finding test
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	Negative control, solvent control, 2.6, 4.3, 7.2, 12, and 20 mg/L, not corrected for purity.
Number of Test Organisms Minimum 10/level, may be divided among containers	20 fish per treatment level or control
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 in each chamber at test initiation and termination and also monitored continuously in one negative control. DO and pH measured daily in alternate replicate chambers of each test level.
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	Yes, solutions collected at 0, 48, and 96 hours were analyzed by GC/ECD

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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	Mean recoveries for each concentration ranged from 95 to 104% of the nominal values.
Control Mortality Not more than 10% control organisms may die or show abnormal behavior.	0% mortality in both negative control and solvent control groups
Raw data included?	Yes
Signs of toxicity (if any) were described?	Yes, signs observed at the three highest concentrations

Mortality

Concentration (ppm)		Number of Fish	Cumulative Number Dead			
			Hour of Study			
Nominal	Mean Measured*		24	48	72	96
Negative Control	ND	20	0	0	0	0
Solvent Control	ND	20	0	0	0	0
2.6	2.6	20	0	0	0	0
4.3	4.1	20	0	0	0	0
7.2	7.5	20	0	0	0	0
12	12	20	0	1	9	16
20	20	20	8	20	20	20

* as total dimethenamid

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Other Significant Results: Signs of test material toxicity included lethargy and dark coloration. Both signs were observed at the three highest-concentration treatment levels.

B. Statistical Results

Statistical method: binomial method

96-hr LC_{50}: 10 ppm
Probit Slope: N/A
95% C.I.: 7.5-12 ppm
NOEC: 4.1 ppm

13. VERIFICATION OF STATISTICAL RESULTS:

Parameter	Result
Binomial Test LC_{50} (C.I.)	10 (7.5-12) ppm
Moving Average Angle LC_{50} (95% C.I.)	N/A
Probit LC_{50} (95% C.I.)	N/A
Probit Slope	N/A
NOEC	4.1 ppm

14. REVIEWER'S COMMENTS: This study is scientifically sound and fulfills the guideline requirements. The 96-hour LC_{50} for bluegill sunfish was determined to be 10 ppm, which classifies SAN 1289H as moderately toxic to the bluegill. The NOEC was determined to be 4.1 ppm. This study is classified as **Core.**

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KARL BULLOCK SAN 1289H BLUEGILL 10-14-97

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CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB. (PERCENT)
20	20	20	100	9.536742E-05
12	20	16	80	.5908966
7.5	20	0	0	9.536742E-05
4.1	20	0	0	9.536742E-05
2.6	20	0	0	9.536742E-05

THE BINOMIAL TEST SHOWS THAT 7.5 AND 12 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 10.36864

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.

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