9-11-96

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

MEMORANDUM

OFFICE OF
PREVENTION, PESTICIDES AND
TOXIC SUBSTANCES

SUBJECT: Data review for Isoxaflutole (D~~222982~~ 229696)

FROM: Renée Costello, Biologist
Environmental Risk Characterization Branch
Environmental Fate and Effects Division (7507C)

THRU: Elizabeth Leovey, Chief
Environmental Risk Characterization Branch
Environmental Fate and Effects Division (7507C)

9/4/96

TO: Joanne Miller, PM 23
Registration Division (7505C)

The following is a summary of data reviewed for isoxaflutole, the DERs are attached to this memo:

GDLN No.	Test Material	MRID	Classification
123-2	RPA 203328	439048-26	Core
72-4	RPA 201772	439048-21	Core
72-1	RPA 202248	439048-22	Core
72-2	RPA 202248	439048-23	Core
72-3	RPA 202248	439048-24	Core
72-1	RPA 203328	439048-25	Core

If there are any questions please contact Renée Costello at 305-5294.

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~~9/3/96~~

MRID No. 439048-26

DATA EVALUATION RECORD
ALGAE OR DIATOM EC_{50} TEST
GUIDELINE 123-2 (TIER II)

1. **CHEMICAL:** Isoxaflutole — PC Code No.: 123000

2. **TEST MATERIAL:** RPA 203328 — Purity: 98.9%

3. **CITATION:**

Authors: James R. Hoberg
Title: RPA 203328 - 5-Day Toxicity to the Freshwater Green Alga *Selenastrum capricornutum*
Study Completion Date: November 22, 1995
Laboratory: Springborn Laboratories, Inc., Wareham, MA
Sponsor: Rhône-Poulenc Secteur Agro, Sophia Antipolis, France
Laboratory Report ID: 95-11-6172
DP Barcode: D222982
MRID No.: 439048-26

4. **REVIEWED BY:** Max Feken, M.S., Environmental Toxicologist, KBN Engineering and Applied Sciences, Inc.

Signature: [signature] **Date:** 8/8/96

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

Signature: P. Kosalwat **Date:** 8/8/96

5. **APPROVED BY:**

Signature: Ronie Costello **Date:** 9/3/96

6. **STUDY PARAMETERS:**

Definitive Test Duration: 120 hours
Type of Concentrations: Mean measured

7. **CONCLUSIONS:** This study is scientifically sound and fulfills the guideline requirements for an aquatic plant toxicity test.

Results Synopsis

EC_{50}: 5.9 ppm ai — 95% C.I.: 4.9 - 7.5 ppm ai

NOEC: 2.4 ppm ai — Probit Slope: N/A

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8. **ADEQUACY OF THE STUDY:**

A. Classification: Core

B. Rationale: N/A

C. Repairability: N/A

9. **GUIDELINE DEVIATIONS:** None

10. **SUBMISSION PURPOSE:**

11. **MATERIALS AND METHODS:**

A. Test Organisms

Guideline Criteria	Reported Information
Species *Skeletonema costatum* *Anabaena flos-aquae* *Selenastrum capricornutum* *Navicula pelliculosa*	*Selenastrum capricornutum*
Initial Number of Cells 3,000 - 10,000 cells/mL	3,000 cells/mL
Nutrients Standard formula, e.g. 20XAAP	AAP medium

B. Test System

Guideline Criteria	Reported Information
Solvent	Acetone (0.1 mL/L)
Temperature Skeletonema: 20°C Others: 24-25°C	24°C
Light Intensity Anabaena: 2.0 Klux (±15%) Others: 4.0-5.0 Klux (±15%)	4.2 - 4.5 Klux
Photoperiod Skeletonema: 14 h light, 10 h dark or 16 h light, 8 h dark Others: Continuous	Continuous

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Guideline Criteria	Reported Information
pH Skeletonema: approx. 8.0 Others: approx. 7.5	Initial: 7.1 - 7.5 Final: 9.1 - 9.3

C. Test Design

Guideline Criteria	Reported Information
Dose range 2X or 3X progression	2X
Doses at least 5	Definitive test: 0.63, 1.3, 2.5, 5.0, and 10 mg ai/L
Controls negative and/or solvent	Negative and solvent control
Replicates per dose 3 or more	3
Duration of test 120 hours	120 hours
Daily observations were made?	Yes
Method of Observations	Cellular counts
Maximum Labeled Rate	Maximum labeled rate for parent compound isoxaflutole (RPA 201772) is 0.1888 lb ai/A

12. REPORTED RESULTS:

Guideline Criteria	Reported Information
Initial and 120 h cell densities were measured?	Yes
Control cell count at 120 hr ≥2X initial count?	Yes
Initial chemical concentrations measured? (Optional)	Yes
Raw data included?	Yes

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Dose Response

Mean Measured Concentration (mg ai/L)	Avg. Cell Density (x 10^4 cells/ml)	% reduction*	120-Hour pH
Control	208	--	9.3
Solvent Cont.	279	--	9.3
0.61	227	19	9.3
1.3	246	12	9.3
2.4	242	13	9.2
4.6	125	55	9.2
9.4	134	52	9.1

*Compared to the solvent control

Other Significant Results: Bloated algal cells and cell fragments were observed in all treatment concentrations and solvent controls.

Statistical Results

Statistical Method: The "best fit" linear regression based on the highest coefficient of determination (r^2) was used for estimating the EC_{50} and Williams' test was used for mean comparisons. Results were based on the mean measured concentrations.

EC_{50}: >9.4 mg ai/L 95% C.I.: N/A

Probit Slope: N/A NOEC: 2.4 mg ai/L

13. **VERIFICATION OF STATISTICAL RESULTS:**

Statistical Method: Moving average method for EC_{50} and Williams' test for mean comparisons. Results based on the mean measured concentrations. All comparisons were made versus the solvent control.

EC_{50}: 5.9 ppm ai 95% C.I.: 4.9 - 7.5 ppm ai

Probit Slope: N/A NOEC: 2.4 ppm ai

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14. **REVIEWER'S COMMENTS:** This study is scientifically sound and fulfills the guideline requirements for an aquatic plant toxicity test. Based on mean measured concentrations, the 120-hour EC_{50} and NOEC for *Selenastrum capricornutum* exposed to RPA 203328 was 5.9 and 2.4 ppm ai, respectively. This study is categorized as **Core**.

MAX FEKEN RPA 203328 SELENASTRUM CAPRICORNUTUM 08-06-96

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CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB. (PERCENT)
9.399999		100	52	52
4.6	100	55	55	0
2.4	100	13	13	0
1.3	100	12	12	0
.61	100	19	19	0

BECAUSE THE NUMBER OF ORGANISMS USED WAS SO LARGE, THE 95 PERCENT CONFIDENCE INTERVALS CALCULATED FROM THE BINOMIAL PROBABILITY ARE UNRELIABLE. USE THE INTERVALS CALCULATED BY THE OTHER TESTS.

AN APPROXIMATE LC50 FOR THIS SET OF DATA IS 4.288935

RESULTS CALCULATED USING THE MOVING AVERAGE METHOD

SPAN	G	LC50	95 PERCENT CONFIDENCE LIMITS	
2	.102894	5.891247	4.871376	7.513031

RESULTS CALCULATED USING THE PROBIT METHOD

ITERATIONS	G	H	GOODNESS OF FIT PROBABILITY
3	2.09465	10.50964	0

A PROBABILITY OF 0 MEANS THAT IT IS LESS THAN 0.001.

SINCE THE PROBABILITY IS LESS THAN 0.05, RESULTS CALCULATED USING THE PROBIT METHOD PROBABLY SHOULD NOT BE USED.

SLOPE = 1.103937
95 PERCENT CONFIDENCE LIMITS =-.493781 AND 2.701656

LC50 = 7.94624
95 PERCENT CONFIDENCE LIMITS = 1.801426 AND +INFINITY

LC10 = .5619971
95 PERCENT CONFIDENCE LIMITS = 0 AND 2.218191

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RPA 203328 - SELENASTRUM CAPRICORNUTUM
File: 43904826 Transform: NO TRANSFORM

t-test of Solvent and Blank Controls Ho:GRP1 MEAN = GRP2 MEAN

GRP1 (SOLVENT CRTL) MEAN =	278.6667	CALCULATED t VALUE =	2.3342
GRP2 (BLANK CRTL) MEAN =	208.3333	DEGREES OF FREEDOM =	4
DIFFERENCE IN MEANS =	70.3333		

TABLE t VALUE (0.05 (2), 4) = 2.776 NO significant difference at alpha=0.05
TABLE t VALUE (0.01 (2), 4) = 4.604 NO significant difference at alpha=0.01

RPA 203328 - SELENASTRUM CAPRICORNUTUM
File: 43904826 Transform: NO TRANSFORM

WILLIAMS TEST (Isotonic regression model) TABLE 1 OF 2

GROUP	IDENTIFICATION	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	GRPS 1&2 POOLED	6	243.500	243.500	243.500
2	0.61	3	227.000	227.000	238.333
3	1.3	3	246.000	246.000	238.333
4	2.4	3	242.000	242.000	238.333
5	4.6	3	125.667	125.667	129.667
6	9.4	3	133.667	133.667	129.667

RPA 203328 - SELENASTRUM CAPRICORNUTUM
File: 43904826 Transform: NO TRANSFORM

WILLIAMS TEST (Isotonic regression model) TABLE 2 OF 2

IDENTIFICATION	ISOTONIZED MEAN	CALC. WILLIAMS	SIG P=.05	TABLE WILLIAMS	DEGREES OF FREEDOM
GRPS 1&2 POOLED	243.500				
0.61	238.333	0.196		1.75	k= 1, v=15
1.3	238.333	0.196		1.84	k= 2, v=15
2.4	238.333	0.196		1.87	k= 3, v=15
4.6	129.667	4.308	*	1.88	k= 4, v=15
9.4	129.667	4.308	*	1.89	k= 5, v=15

s = 37.373
Note: df used for table values are approximate when v > 20.

RPA 203328 - SELENASTRUM CAPRICORNUTUM
File: 43904826 Transform: NO TRANSFORMATION

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	6	60765.143	10127.524	10.479
Within (Error)	14	13530.667	966.476	
Total	20	74295.810		

Critical F value = 2.85 (0.05,6,14)
Since F > Critical F REJECT Ho: All equal

RPA 203328 - SELENASTRUM CAPRICORNUTUM
File: 43904826 Transform: NO TRANSFORMATION

DUNNETT'S TEST - TABLE 1 OF 2 Ho:Control<Treatment

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	T STAT	SIG
1	SOLVENT	278.667	278.667		
2	CONTROL	208.333	208.333	2.771	*
3	0.61	227.000	227.000	2.035	
4	1.3	246.000	246.000	1.287	
5	2.4	242.000	242.000	1.445	
6	4.6	125.667	125.667	6.028	*
7	9.4	133.667	133.667	5.712	*

Dunnett table value = 2.53 (1 Tailed Value, P=0.05, df=14,6)

RPA 203328 - SELENASTRUM CAPRICORNUTUM
File: 43904826 Transform: NO TRANSFORMATION

DUNNETT'S TEST - TABLE 2 OF 2 Ho:Control<Treatment

GROUP	IDENTIFICATION	NUM OF REPS	Minimum Sig Diff (IN ORIG. UNITS)	% of CONTROL	DIFFERENCE FROM CONTROL
1	SOLVENT	3			
2	CONTROL	3	64.220	23.0	70.333
3	0.61	3	64.220	23.0	51.667
4	1.3	3	64.220	23.0	32.667
5	2.4	3	64.220	23.0	36.667
6	4.6	3	64.220	23.0	153.000
7	9.4	3	64.220	23.0	145.000

NOEL = 2.4 mg ai/L

RPA 203328 - SELENASTRUM CAPRICORNUTUM
File: 43904826 Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 1 OF 2

GROUP	IDENTIFICATION	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	SOLVENT	3	278.667	278.667	278.667
2	CONTROL	3	208.333	208.333	230.833
3	0.61	3	227.000	227.000	230.833
4	1.3	3	246.000	246.000	230.833
5	2.4	3	242.000	242.000	230.833
6	4.6	3	125.667	125.667	129.667
7	9.4	3	133.667	133.667	129.667

RPA 203328 - SELENASTRUM CAPRICORNUTUM
File: 43904826 Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 2 OF 2

IDENTIFICATION	ISOTONIZED MEAN	CALC. WILLIAMS	SIG P=.05	TABLE WILLIAMS	DEGREES OF FREEDOM
SOLVENT	278.667				
CONTROL	230.833	1.884	*	1.76	k= 1, v=14
0.61	230.833	1.884	*	1.85	k= 2, v=14
1.3	230.833	1.884	*	1.88	k= 3, v=14
2.4	230.833	1.884		1.89	k= 4, v=14
4.6	129.667	5.870	*	1.90	k= 5, v=14
9.4	129.667	5.870	*	1.91	k= 6, v=14

s = 31.088
Note: df used for table values are approximate when v > 20.

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9-3-96

MRID No. 439048-21

DATA EVALUATION RECORD
AQUATIC INVERTEBRATE LIFE CYCLE TEST
GUIDELINE 72-4

1. **CHEMICAL:** Isoxaflutole PC Code No.: 123000

2. **TEST MATERIAL:** Isoxaflutole (RPA 201772 Technical) Purity: 96.8%

3. **CITATION:**

Author: Joseph V. Sousa
Title: Isoxaflutole - Chronic Toxicity to Mysids (*Mysidopsis bahia*) Under Flow-Through Conditions
Study Completion Date: December 1, 1995
Laboratory: Springborn Laboratories, Inc., Wareham, MA
Sponsor: Rhône-Poulenc Ag Company, Research Triangle Park, NC
Laboratory Report ID: 95-8-6017
MRID No.: 439048-21
DP Barcode: D222982

4. **REVIEWED BY:** Max Feken, M.S., Environmental Toxicologist, KBN Engineering and Applied Sciences, Inc.

Signature: M. Feken **Date:** 8/8/96

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

Signature: P. Kosalwat **Date:** 8/8/96

5. **APPROVED BY:**

Signature: Renée Costello **Date:** 9/3/96

6. **STUDY PARAMETERS:**

Age of Test Organism: ≤24 hours
Definitive Test Duration: 28 days
Study Method: Flow-Through
Type of Concentrations: Mean Measured

7. **CONCLUSIONS:** This study is scientifically sound and fulfills the guideline requirements for a saltwater invertebrate life-cycle test.

Results Synopsis: Most sensitive endpoint: survival

NOEC: 1.0 ppb ai LOEC: 1.9 ppb ai MATC: 1.4 ppb ai

LOEC's for specific endpoints:
Neonates Produced: >3.8 ppb ai
Mysid Survival: 1.9 ppb ai
Growth (length): >1.9 ppb ai
Growth (weight): >1.9 ppb ai

8. **ADEQUACY OF THE STUDY:**

A. Classification: Core

B. Rationale: N/A

C. Repairability: N/A

9. **GUIDELINE DEVIATIONS:** Since an EPA SEP for the mysid life cycle test does not exist, ASTM's Standard Guide for Conducting Life-Cycle Toxicity Tests With Saltwater Mysids (E1191-90) was used as a guidance in this evaluation. Deviations from the ASTM's guidelines are noted as follows:

1. The source of the fresh water used to prepare the artificial seawater was not reported. However, the dilution water was apparently adequate for satisfactory survival, growth, and reproduction of the control mysids.

10. **SUBMISSION PURPOSE:**

11. **MATERIALS AND METHODS**

A. Test Organisms/Acclimation

Guideline Criteria	Reported Information
Species *Mysidopsis* spp.	*Mysidopsis bahia*
Source Laboratory, commercial, or wild stock.	In-house cultures
Parental Acclimation Conditions Parental stock must be maintained separately from the brood culture in dilution water and under test conditions.	Held under test conditions at 25-26°C in dilution water
Parental Acclimation Period At least 14 days.	Continuous

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Guideline Criteria	Reported Information
Age of Parental Stock At least 10-12 days old at the beginning of the acclimation period.	Not reported
Food Brine shrimp nauplii in possible combination with rotifers and/or algae.	Mysids were fed freshly hatched brine shrimp nauplii twice daily, with one feeding supplemented with Selco®.
Food Concentration 150 brine shrimp nauplii per mysid per day.	Not reported
Were mysids in good health during acclimation period?	Yes

B. Test System

Guideline Criteria	Reported Information
Test Water Unpolluted saltwater that has been tested for contaminants, or appropriate reconstituted water.	Artificial seawater prepared from filtered freshwater to a salinity of 25 ± 3‰.
Water Temperature 27 ±2°C.	26-28°C
pH	8.0 to 8.3
Dissolved Oxygen ≥60% throughout test.	≥78% of saturation during the test
Test Vessels or Compartments 1. Material: Glass, No. 316 stainless steel, or perfluorocarbon plastics 2. Size: 250 mL with 200 mL fill volume is preferred; 100 mL with 80 mL fill volume is acceptable.	1. Glass 2. Each aquaria (39 x 20 x 25 cm) contained two retention chambers consisting of glass Petri dishes (10 cm diameter) with 15-cm high Nitex® screen collars.

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Guideline Criteria	Reported Information
Type of Dilution System Must provide reproducible supply of toxicant. Intermittent flow proportional diluters or continuous flow serial diluters should be used.	Intermittent-flow proportional diluter.
Flow Rate At least 5 volume additions per 24 hours.	12 volume additions per 24 hours providing 90% replacement in approximately 5 hours.
Aeration Dilution water should be vigorously aerated, but the test tanks should not be aerated.	Dilution water was aerated prior to use.
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. Acceptable solvents are dimethylformamide, triethylene glycol, methanol, acetone and ethanol.	Solvent: acetone Maximum conc.: 0.0065 mL/L

C. Test Design

Guideline Criteria	Reported Information
Duration	28 days
Nominal Concentrations Control(s) and at least 5 test concentrations; dilution factor not less than 50%.	Dilution water control, solvent control, and five treatment concentrations: 0.31, 0.62, 1.2, 2.5, and 5.0 µg ai/L.

Guideline Criteria	Reported Information
Number of Test Organisms 60 mysids/level; At least two test replicate vessels, each containing two chambers, with each chamber containing 15 mysids until 10 or 14 days after initiation. After sexing, at least 10 mated pairs per replicate.	60 mysids/level; 2 replicate vessels each containing 2 retention chambers with 15 mysids each for the first 14 days; 10 pairing jars with mated pairs and the remaining males and females separated in single retention chambers from day 15 to test termination.
Test organisms randomly or impartially assigned to test vessels?	Impartially distributed
Renewal Parent mysids in all beakers must be transferred to containers with fresh test solution (< 4 hours old) three times each week (e.g. every Monday, Wednesday and Friday).	N/A
Water Parameter Measurements 1. Dissolved oxygen must be measured at each concentration at least once a week. 2. pH must be measured once a week in one test concentration and in one control. 3. Temperature should be monitored at least hourly throughout the test in one test chamber, and near the beginning, middle and end of the test in all test chambers.	1. Dissolved oxygen was measured daily in each vessel. 2. The pH was measured daily in each test vessel. 3. Temperature was measured daily in each vessel and continuously in one replicate vessel of the dilution water control.
Chemical Analysis Needed 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 removed and analyzed on days 0, 2, 7, 14, 21, and 28. Results based on the mean measured concentrations.

12. REPORTED RESULTS

A. General Results

Guideline Criteria	Reported Information
Quality assurance and GLP compliance statements were included in the report?	Yes
Control Mortality ≤30% between pairing and test termination.	18% and 23% for control and solvent control, respectively.
Did at least 75% of the paired female mysids in each control produce at least 3 young by test termination?	Yes
Data Endpoints - Survival of first-generation mysids, - Number of young produced per female, - Dry weight (required) and length (optional) of each first generation mysid alive at the end of the test, - Observations of other effects or clinical signs.	- Survival of parental mysids, - Number of offspring per female per reproductive day, - Male and female dry weight and length of surviving first generation mysids.
Raw data included?	Yes

Effects Data

Toxicant Concentration (µg ai/L)		Percent Dead or Immobile (28 Days)	Number of Young per Female per Reprod. Day	Mean Total Length (mm)	Mean Dry Weight (mg)
Nominal	Measured				
Control	<0.1	18	0.44	M 7.1 F 7.0	M 0.84 F 0.85
Solvent	<0.1	23	0.53	M 7.1 F 7.0	M 0.85 F 0.97
0.31	0.30	23	0.73	M 7.1 F 7.1	M 0.76 F 1.0

Toxicant Concentration (µg ai/L)		Percent Dead or Immobile (28 Days)	Number of Young per Female per Reprod. Day	Mean Total Length (mm)	Mean Dry Weight (mg)
Nominal	Measured				
0.62	0.52	37	0.67	M 7.3 F 7.2	M 0.84 F 0.96
1.2	1.0	30	0.58	M 7.1 F 7.0	M 0.89 F 1.0
2.5	1.9	52	0.40	M 6.9 F 7.1	M 0.84 F 0.99
5.0	3.8	87	0.53	M 7.1 F 7.2	M 0.84 F 0.85

Toxicity Observations: None.

B. Statistical Results: The results are based on mean measured concentrations.

Endpoint	Method	NOEC (µg ai/L)	LOEC (µg ai/L)
Survival	Williams' test	1.0	1.9
Reproduction[a]	Williams' test	1.0	ND[b]
Length[a]	Williams' test	1.0	ND
Dry weight[a]	Williams' test	1.0	ND

[a]Since survival was significantly affected at the two highest treatment levels (1.9 and 3.8 µg ai/L), reproductive and growth data for these treatment levels were not included in the statistical analysis.
[b]ND - Not determined

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13. VERIFICATION OF STATISTICAL RESULTS

Endpoint	Method	NOEC (ppb ai)	LOEC (ppb ai)
Survival	Williams' test	1.0	1.9
Reproduction	Visual inspection	3.8	>3.8
Length[a]	Bonferroni's test	1.9	>1.9
Dry weight[a]	Bonferroni's test	1.9	>1.9

[a]Growth data from the highest test concentration were not included in the analysis due to complete mortality in some replicates.

14. REVIEWER'S COMMENTS: This study is scientifically sound, fulfills the guideline requirements for a mysid life-cycle test, and can be classified as **Core**. Based on the most sensitive endpoint (survival), the NOEC and LOEC are 1.0 and 1.9 ppb ai, respectively. The geometric mean MATC is 1.4 ppb ai.

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ISOXAFLUTOLE - MYSID SURVIVAL
File: 43904821 Transform: ARC SINE(SQUARE ROOT(Y))

WILLIAMS TEST (Isotonic regression model) TABLE 1 OF 2

GROUP	IDENTIFICATION	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	SOLVENT	2	0.765	1.068	1.102
2	CONTROL	2	0.820	1.136	1.102
3	0.30	2	0.770	1.071	1.071
4	0.52	2	0.635	0.923	0.958
5	1.0	2	0.700	0.992	0.958
6	1.9	2	0.485	0.770	0.770
7	3.8	2	0.134	0.363	0.363

ISOXAFLUTOLE - MYSID SURVIVAL
File: 43904821 Transform: ARC SINE(SQUARE ROOT(Y))

WILLIAMS TEST (Isotonic regression model) TABLE 2 OF 2

IDENTIFICATION	ISOTONIZED MEAN	CALC. WILLIAMS	SIG P=.05	TABLE WILLIAMS	DEGREES OF FREEDOM
SOLVENT	1.102				
CONTROL	1.102	0.347		1.89	k= 1, v= 7
0.30	1.071	0.022		2.00	k= 2, v= 7
0.52	0.958	1.136		2.04	k= 3, v= 7
1.0	0.958	1.136		2.06	k= 4, v= 7
1.9	0.770	3.053	*	2.07	k= 5, v= 7
3.8	0.363	7.222	*	2.08	k= 6, v= 7

s = 0.098
Note: df used for table values are approximate when v > 20.

NOEC = 1.0 µg ai/L

ISOXAFLUTOLE - MYSID SURVIVAL
File: 43904821 Transform: ARC SINE(SQUARE ROOT(Y))

t-test of Solvent and Blank Controls Ho:GRP1 MEAN = GRP2 MEAN

GRP1 (SOLVENT CRTL) MEAN =	1.0685	CALCULATED t VALUE =	-0.6683
GRP2 (BLANK CRTL) MEAN =	1.1363	DEGREES OF FREEDOM =	2
DIFFERENCE IN MEANS =	-0.0678		

TABLE t VALUE (0.05 (2), 2) = 4.303 NO significant difference at alpha=0.05
TABLE t VALUE (0.01 (2), 2) = 9.925 NO significant difference at alpha=0.01

ISOXAFLUTOLE - MYSID SURVIVAL
File: 43904821 Transform: ARC SINE(SQUARE ROOT(Y))

WILLIAMS TEST (Isotonic regression model) TABLE 1 OF 2

G.	JP	IDENTIFICATION	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1		GRPS 1&2 POOLED	4	0.793	1.102	1.102
2		0.30	2	0.770	1.071	1.071
3		0.52	2	0.635	0.923	0.958
4		1.0	2	0.700	0.992	0.958
5		1.9	2	0.485	0.770	0.770
6		3.8	2	0.134	0.363	0.363

ISOXAFLUTOLE - MYSID SURVIVAL
File: 43904821 Transform: ARC SINE(SQUARE ROOT(Y))

WILLIAMS TEST (Isotonic regression model) TABLE 2 OF 2

IDENTIFICATION	ISOTONIZED MEAN	CALC. WILLIAMS	SIG P=.05	TABLE WILLIAMS	DEGREES OF FREEDOM
GRPS 1&2 POOLED	1.102				
0.30	1.071	0.388		1.86	k= 1, v= 8
0.52	0.958	1.770		1.96	k= 2, v= 8
1.0	0.958	1.770		2.00	k= 3, v= 8
1.9	0.770	4.059	*	2.01	k= 4, v= 8
3.8	0.363	9.038	*	2.02	k= 5, v= 8

s = 0.094
Note: df used for table values are approximate when v > 20.

ISOXAFLUTOLE - MYSID CHRONIC TEST
13:38 Tuesday, August 6, 1996

---------- TRT=I ----------

Variable	N	Mean	Std Dev	Minimum	Maximum
MLNGTH	19	7.1052632	0.5016348	5.8000000	8.0000000
FLNGTH	27	7.1370370	0.3212334	6.5000000	7.7000000
MWGHT	19	0.7621053	0.1660515	0.3400000	1.0500000
FWGHT	27	1.0022222	0.1868429	0.6200000	1.4100000

---------- TRT=II ----------

Variable	N	Mean	Std Dev	Minimum	Maximum
MLNGTH	15	7.2600000	0.2501428	6.7000000	7.6000000
FLNGTH	23	7.1956522	0.3067102	6.5000000	8.0000000
MWGHT	15	0.8380000	0.0970420	0.6500000	1.0200000
FWGHT	23	0.9630435	0.2244677	0.4500000	1.3800000

---------- TRT=III ----------

Variable	N	Mean	Std Dev	Minimum	Maximum
MLNGTH	20	7.1200000	0.3607011	6.5000000	7.7000000
FLNGTH	22	7.0227273	0.3421665	6.5000000	7.9000000
MWGHT	20	0.8940000	0.1284482	0.6400000	1.1400000
FWGHT	22	1.0000000	0.2065361	0.5900000	1.4900000

---------- TRT=IV ----------

Variable	N	Mean	Std Dev	Minimum	Maximum
MLNGTH	21	6.9000000	0.3301515	6.2000000	7.4000000
FLNGTH	8	7.0500000	0.4105745	6.4000000	7.7000000
MWGHT	21	0.8357143	0.0861145	0.6900000	0.9700000
FWGHT	8	0.9862500	0.2597217	0.6100000	1.3800000

---------- TRT=cont ----------

Variable	N	Mean	Std Dev	Minimum	Maximum
MLNGTH	22	7.0681818	0.2643705	6.5000000	7.4000000
FLNGTH	27	7.0185185	0.3088901	6.5000000	7.6000000
MWGHT	22	0.8418182	0.1332608	0.5400000	1.0800000
FWGHT	27	0.8548148	0.2063300	0.3600000	1.2200000

---------- TRT=solv ----------

Variable	N	Mean	Std Dev	Minimum	Maximum
MLNGTH	24	7.1041667	0.2726348	6.5000000	7.7000000
FLNGTH	22	7.0181818	0.3775061	6.2000000	7.9000000
MWGHT	24	0.8483333	0.1053634	0.6600000	1.0500000
FWGHT	22	0.9745455	0.2261842	0.6000000	1.5300000

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General Linear Models Procedure
Class Level Information

Class	Levels	Values
TRT	6	I II III IV cont solv
REP	2	a b

Number of observations in data set = 148

Group	Obs	Dependent Variables
1	121	MLNGTH MWGHT
2	129	FLNGTH FWGHT

NOTE: Variables in each group are consistent with respect to the presence or absence of missing values.

ISOXAFLUTOLE - MYSID CHRONIC TEST
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General Linear Models Procedure

Dependent Variable: MLNGTH

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	6	1.2291015	0.2048502	1.77	0.1125
Error	114	13.2310638	0.1160620		
Corrected Total	120	14.4601653			

R-Square	C.V.	Root MSE	MLNGTH Mean
0.084999	4.808927	0.3407	7.0843

Source	DF	Type I SS	Mean Square	F Value	Pr > F
TRT	5	1.2253810	0.2450762	2.11	0.0690
REP	1	0.0037205	0.0037205	0.03	0.8582

Source	DF	Type III SS	Mean Square	F Value	Pr > F
TRT	5	1.2288377	0.2457675	2.12	0.0683
REP	1	0.0037205	0.0037205	0.03	0.8582

ISOXAFLUTOLE - MYSID CHRONIC TEST
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General Linear Models Procedure

Dependent Variable: MWGHT

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	6	0.1921510	0.0320252	2.15	0.0534
Error	114	1.7012011	0.0149228		
Corrected Total	120	1.8933521			

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R-Square	C.V.	Root MSE	MWGHT Mean
0.101487	14.58291	0.1222	0.8377

Source	DF	Type I SS	Mean Square	F Value	Pr > F
TRT	5	0.1751414	0.0350283	2.35	0.0455
REP	1	0.0170096	0.0170096	1.14	0.2879

Source	DF	Type III SS	Mean Square	F Value	Pr > F
TRT	5	0.1743000	0.0348600	2.34	0.0464
REP	1	0.0170096	0.0170096	1.14	0.2879

ISOXAFLUTOLE - MYSID CHRONIC TEST
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General Linear Models Procedure
Least Squares Means

TRT	MLNGTH LSMEAN	i/j	Pr > |T| HO: LSMEAN(i)=LSMEAN(j) 1	2	3	4	5	6
I	7.10555750	1	.	0.1962	0.8909	0.0585	0.7268	0.9894
II	7.25888151	2	0.1962	.	0.2385	0.0022	0.0978	0.1710
III	7.12055925	3	0.8909	0.2385	.	0.0403	0.6199	0.8741
IV	6.89866846	4	0.0585	0.0022	0.0403	.	0.1065	0.0464
cont	7.06818182	5	0.7268	0.0978	0.6199	0.1065	.	0.7211
solv	7.10416667	6	0.9894	0.1710	0.8741	0.0464	0.7211	.

TRT	MWGHT LSMEAN	i/j	Pr > |T| HO: LSMEAN(i)=LSMEAN(j) 1	2	3	4	5	6
I	0.76147590	1	.	0.0646	0.0011	0.0494	0.0380	0.0224
II	0.84039157	2	0.0646	.	0.2131	0.9647	0.9723	0.8440
III	0.89280422	3	0.0011	0.2131	.	0.1600	0.1796	0.2319
IV	0.83856139	4	0.0494	0.9647	0.1600	.	0.9307	0.7900
cont	0.84181818	5	0.0380	0.9723	0.1796	0.9307	.	0.8569
solv	0.84833333	6	0.0224	0.8440	0.2319	0.7900	0.8569	.

NOTE: To ensure overall protection level, only probabilities associated with pre-planned comparisons should be used.

ISOXAFLUTOLE - MYSID CHRONIC TEST
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General Linear Models Procedure

Bonferroni (Dunn) T tests for variable: MLNGTH

NOTE: This test controls the type I experimentwise error rate but generally has a higher type II error rate than Tukey's for all pairwise comparisons.

Alpha= 0.05 Confidence= 0.95 df= 114 MSE= 0.116062
Critical Value of T= 2.99831

Comparisons significant at the 0.05 level are indicated by '***'.

TRT Comparison	Simultaneous Lower Confidence Limit	Difference Between Means	Simultaneous Upper Confidence Limit	
II - III	-0.20890	0.14000	0.48890	
II - I	-0.19807	0.15474	0.50755	
II - solv	-0.18037	0.15583	0.49204	
II - cont	-0.15021	0.19182	0.53385	
II - IV	0.01468	0.36000	0.70532	***
III - II	-0.48890	-0.14000	0.20890	
III - I	-0.31250	0.01474	0.34197	
III - solv	-0.29343	0.01583	0.32510	
III - cont	-0.26377	0.05182	0.36741	
III - IV	-0.09915	0.22000	0.53915	
I - II	-0.50755	-0.15474	0.19807	
I - III	-0.34197	-0.01474	0.31250	
I - solv	-0.31257	0.00110	0.31477	
I - cont	-0.28283	0.03708	0.35699	
I - IV	-0.11816	0.20526	0.52868	
solv - II	-0.49204	-0.15583	0.18037	
solv - III	-0.32510	-0.01583	0.29343	
solv - I	-0.31477	-0.00110	0.31257	
solv - cont	-0.26551	0.03598	0.33748	
solv - IV	-0.10105	0.20417	0.50939	
cont - II	-0.53385	-0.19182	0.15021	
cont - III	-0.36741	-0.05182	0.26377	
cont - I	-0.35699	-0.03708	0.28283	
cont - solv	-0.33748	-0.03598	0.26551	
cont - IV	-0.14345	0.16818	0.47981	
IV - II	-0.70532	-0.36000	-0.01468	***
IV - III	-0.53915	-0.22000	0.09915	
IV - I	-0.52868	-0.20526	0.11816	
IV - solv	-0.50939	-0.20417	0.10105	
IV - cont	-0.47981	-0.16818	0.14345	

ISOXAFLUTOLE - MYSID CHRONIC TEST
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General Linear Models Procedure

Bonferroni (Dunn) T tests for variable: MWGHT

NOTE: This test controls the type I experimentwise error rate but generally has a higher type II error rate than Tukey's for all pairwise comparisons.

Alpha= 0.05 Confidence= 0.95 df= 114 MSE= 0.014923
Critical Value of T= 2.99831

Comparisons significant at the 0.05 level are indicated by '***'.

TRT Comparison	Simultaneous Lower Confidence Limit	Difference Between Means	Simultaneous Upper Confidence Limit	
III - solv	-0.06523	0.04567	0.15656	
III - cont	-0.06098	0.05218	0.16534	
III - II	-0.06911	0.05600	0.18111	
III - IV	-0.05615	0.05829	0.17272	
III - I	0.01456	0.13189	0.24923	***
solv - III	-0.15656	-0.04567	0.06523	
solv - cont	-0.10159	0.00652	0.11462	
solv - II	-0.11022	0.01033	0.13089	
solv - IV	-0.09683	0.01262	0.12206	
solv - I	-0.02625	0.08623	0.19870	

cont - III	-0.16534	-0.05218	0.06098
cont - solv	-0.11462	-0.00652	0.10159
cont - II	-0.11883	0.00382	0.12646
cont - IV	-0.10564	0.00610	0.11785
cont - I	-0.03500	0.07971	0.19442
II - III	-0.18111	-0.05600	0.06911
II - solv	-0.13089	-0.01033	0.11022
II - cont	-0.12646	-0.00382	0.11883
II - IV	-0.12154	0.00229	0.12611
II - I	-0.05061	0.07589	0.20240
IV - III	-0.17272	-0.05829	0.05615
IV - solv	-0.12206	-0.01262	0.09683
IV - cont	-0.11785	-0.00610	0.10564
IV - II	-0.12611	-0.00229	0.12154
IV - I	-0.04236	0.07361	0.18958
I - III	-0.24923	-0.13189	-0.01456 ***
I - solv	-0.19870	-0.08623	0.02625
I - cont	-0.19442	-0.07971	0.03500
I - II	-0.20240	-0.07589	0.05061
I - IV	-0.18958	-0.07361	0.04236

ISOXAFLUTOLE - MYSID CHRONIC TEST
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General Linear Models Procedure

Dunnett's One-tailed T tests for variable: MLNGTH

NOTE: This tests controls the type I experimentwise error for comparisons of all treatments against a control.

Alpha= 0.05 Confidence= 0.95 df= 114 MSE= 0.116062
Critical Value of Dunnett's T= 2.277

Comparisons significant at the 0.05 level are indicated by '***'.

TRT Comparison	Simultaneous Lower Confidence Limit	Difference Between Means	Simultaneous Upper Confidence Limit
II - solv	-0.09954	0.15583	0.41121
III - solv	-0.21908	0.01583	0.25075
I - solv	-0.23716	0.00110	0.23936
cont - solv	-0.26500	-0.03598	0.19303
IV - solv	-0.43601	-0.20417	0.02767

ISOXAFLUTOLE - MYSID CHRONIC TEST
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General Linear Models Procedure

Dunnett's One-tailed T tests for variable: MWGHT

NOTE: This tests controls the type I experimentwise error for comparisons of all treatments against a control.

Alpha= 0.05 Confidence= 0.95 df= 114 MSE= 0.014923
Critical Value of Dunnett's T= 2.277

Comparisons significant at the 0.05 level are indicated by '***'.

TRT Comparison	Simultaneous Lower Confidence Limit	Difference Between Means	Simultaneous Upper Confidence Limit

TRT Comparison	Simultaneous Lower Confidence Limit	Difference Between Means	Simultaneous Upper Confidence Limit
III - solv	-0.03857	0.04567	0.12990
cont - solv	-0.08863	-0.00652	0.07560
II - solv	-0.10191	-0.01033	0.08124
IV - solv	-0.09575	-0.01262	0.07051
I - solv	-0.17166	-0.08623	-0.00079 ***

ISOXAFLUTOLE - MYSID CHRONIC TEST
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General Linear Models Procedure

Dependent Variable: FLNGTH

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	6	0.6908576	0.1151429	1.02	0.4185
Error	122	13.8339486	0.1133930		
Corrected Total	128	14.5248062			

R-Square	C.V.	Root MSE	FLNGTH Mean
0.047564	4.757865	0.3367	7.0775

Source	DF	Type I SS	Mean Square	F Value	Pr > F
TRT	5	0.6601736	0.1320347	1.16	0.3306
REP	1	0.0306839	0.0306839	0.27	0.6039

Source	DF	Type III SS	Mean Square	F Value	Pr > F
TRT	5	0.6825882	0.1365176	1.20	0.3114
REP	1	0.0306839	0.0306839	0.27	0.6039

ISOXAFLUTOLE - MYSID CHRONIC TEST
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General Linear Models Procedure

Dependent Variable: FWGHT

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	6	0.3935235	0.0655872	1.44	0.2055
Error	122	5.5639013	0.0456057		
Corrected Total	128	5.9574248			

R-Square	C.V.	Root MSE	FWGHT Mean
0.066056	22.28490	0.2136	0.9583

Source	DF	Type I SS	Mean Square	F Value	Pr > F
TRT	5	0.3920642	0.0784128	1.72	0.1351
REP	1	0.0014593	0.0014593	0.03	0.8583

Source	DF	Type III SS	Mean Square	F Value	Pr > F
TRT	5	0.3904926	0.0780985	1.71	0.1367
REP	1	0.0014593	0.0014593	0.03	0.8583

ISOXAFLUTOLE - MYSID CHRONIC TEST
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General Linear Models Procedure
Least Squares Means

TRT	FLNGTH LSMEAN	Pr > |T| HO: LSMEAN(i)=LSMEAN(j) i/j	1	2	3	4	5	6
I	7.13645686	1	.	0.5069	0.2309	0.5248	0.1942	0.2361
II	7.20041970	2	0.5069	.	0.0777	0.2797	0.0590	0.0767
III	7.01987914	3	0.2309	0.0777	.	0.8290	0.9745	0.9910
IV	7.05000000	4	0.5248	0.2797	0.8290	.	0.8069	0.8354
cont	7.01677799	5	0.1942	0.0590	0.9745	0.8069	.	0.9652
solv	7.02102995	6	0.2361	0.0767	0.9910	0.8354	0.9652	.

TRT	FWGHT LSMEAN	Pr > |T| HO: LSMEAN(i)=LSMEAN(j) i/j	1	2	3	4	5	6
I	1.00234875	1	.	0.5092	0.9776	0.8518	0.0126	0.6447
II	0.96200376	2	0.5092	.	0.5496	0.7830	0.0830	0.8519
III	1.00062113	3	0.9776	0.5496	.	0.8709	0.0193	0.6809
IV	0.98625000	4	0.8518	0.7830	0.8709	.	0.1301	0.8891
cont	0.85519440	5	0.0126	0.0830	0.0193	0.1301	.	0.0562
solv	0.97392432	6	0.6447	0.8519	0.6809	0.8891	0.0562	.

NOTE: To ensure overall protection level, only probabilities associated with pre-planned comparisons should be used.

ISOXAFLUTOLE - MYSID CHRONIC TEST
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General Linear Models Procedure

Bonferroni (Dunn) T tests for variable: FLNGTH

NOTE: This test controls the type I experimentwise error rate but generally has a higher type II error rate than Tukey's for all pairwise comparisons.

Alpha= 0.05 Confidence= 0.95 df= 122 MSE= 0.113393
Critical Value of T= 2.99410

Comparisons significant at the 0.05 level are indicated by '***'.

TRT Comparison	Simultaneous Lower Confidence Limit	Difference Between Means	Simultaneous Upper Confidence Limit
II - I	-0.22747	0.05862	0.34470
II - IV	-0.26819	0.14565	0.55949
II - III	-0.12775	0.17292	0.47360
II - cont	-0.10895	0.17713	0.46322
II - solv	-0.12320	0.17747	0.47814
I - II	-0.34470	-0.05862	0.22747
I - IV	-0.31881	0.08704	0.49289
I - III	-0.17527	0.11431	0.40389
I - cont	-0.15589	0.11852	0.39292
I - solv	-0.17072	0.11886	0.40843
IV - II	-0.55949	-0.14565	0.26819
IV - I	-0.49289	-0.08704	0.31881

IV	- III	-0.38899	0.02727	0.44353
IV	- cont	-0.37437	0.03148	0.43733
IV	- solv	-0.38444	0.03182	0.44808
III	- II	-0.47360	-0.17292	0.12775
III	- I	-0.40389	-0.11431	0.17527
III	- IV	-0.44353	-0.02727	0.38899
III	- cont	-0.28537	0.00421	0.29379
III	- solv	-0.29945	0.00455	0.30854
cont	- II	-0.46322	-0.17713	0.10895
cont	- I	-0.39292	-0.11852	0.15589
cont	- IV	-0.43733	-0.03148	0.37437
cont	- III	-0.29379	-0.00421	0.28537
cont	- solv	-0.28924	0.00034	0.28991
solv	- II	-0.47814	-0.17747	0.12320
solv	- I	-0.40843	-0.11886	0.17072
solv	- IV	-0.44808	-0.03182	0.38444
solv	- III	-0.30854	-0.00455	0.29945
solv	- cont	-0.28991	-0.00034	0.28924

ISOXAFLUTOLE - MYSID CHRONIC TEST
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General Linear Models Procedure

Bonferroni (Dunn) T tests for variable: FWGHT

NOTE: This test controls the type I experimentwise error rate but generally has a higher type II error rate than Tukey's for all pairwise comparisons.

Alpha= 0.05 Confidence= 0.95 df= 122 MSE= 0.045606
Critical Value of T= 2.99410

Comparisons significant at the 0.05 level are indicated by '***'.

TRT Comparison	Simultaneous Lower Confidence Limit	Difference Between Means	Simultaneous Upper Confidence Limit
I - III	-0.18142	0.00222	0.18587
I - IV	-0.24141	0.01597	0.27336
I - solv	-0.15597	0.02768	0.21132
I - II	-0.14225	0.03918	0.22061
I - cont	-0.02662	0.14741	0.32143
III - I	-0.18587	-0.00222	0.18142
III - IV	-0.25024	0.01375	0.27774
III - solv	-0.16733	0.02545	0.21824
III - II	-0.15372	0.03696	0.22764
III - cont	-0.03846	0.14519	0.32883
IV - I	-0.27336	-0.01597	0.24141
IV - III	-0.27774	-0.01375	0.25024
IV - solv	-0.25228	0.01170	0.27569
IV - II	-0.23924	0.02321	0.28566
IV - cont	-0.12595	0.13144	0.38882
solv - I	-0.21132	-0.02768	0.15597
solv - III	-0.21824	-0.02545	0.16733
solv - IV	-0.27569	-0.01170	0.25228
solv - II	-0.17918	0.01150	0.20218
solv - cont	-0.06392	0.11973	0.30338
II - I	-0.22061	-0.03918	0.14225

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II - III	-0.22764	-0.03696	0.15372
II - IV	-0.28566	-0.02321	0.23924
II - solv	-0.20218	-0.01150	0.17918
II - cont	-0.07320	0.10823	0.28966
cont - I	-0.32143	-0.14741	0.02662
cont - III	-0.32883	-0.14519	0.03846
cont - IV	-0.38882	-0.13144	0.12595
cont - solv	-0.30338	-0.11973	0.06392
cont - II	-0.28966	-0.10823	0.07320

ISOXAFLUTOLE - MYSID CHRONIC TEST
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General Linear Models Procedure

Dunnett's One-tailed T tests for variable: FLNGTH

NOTE: This tests controls the type I experimentwise error for comparisons of all treatments against a control.

Alpha= 0.05 Confidence= 0.95 df= 122 MSE= 0.113393
Critical Value of Dunnett's T= 2.266

Comparisons significant at the 0.05 level are indicated by '***'.

TRT Comparison	Simultaneous Lower Confidence Limit	Difference Between Means	Simultaneous Upper Confidence Limit
II - solv	-0.05012	0.17747	0.40506
I - solv	-0.10034	0.11886	0.33805
IV - solv	-0.28327	0.03182	0.34691
III - solv	-0.22556	0.00455	0.23465
cont - solv	-0.21886	0.00034	0.21953

ISOXAFLUTOLE - MYSID CHRONIC TEST
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General Linear Models Procedure

Dunnett's One-tailed T tests for variable: FWGHT

NOTE: This tests controls the type I experimentwise error for comparisons of all treatments against a control.

Alpha= 0.05 Confidence= 0.95 df= 122 MSE= 0.045606
Critical Value of Dunnett's T= 2.266

Comparisons significant at the 0.05 level are indicated by '***'.

TRT Comparison	Simultaneous Lower Confidence Limit	Difference Between Means	Simultaneous Upper Confidence Limit
I - solv	-0.11133	0.02768	0.16669
III - solv	-0.12048	0.02545	0.17139
IV - solv	-0.18812	0.01170	0.21153
II - solv	-0.15584	-0.01150	0.13283
cont - solv	-0.25874	-0.11973	0.01928

ANALYSIS USING TRT*REP INTERACTION AS THE ERROR TERM
13:38 Tuesday, August 6, 1996

General Linear Models Procedure
Class Level Information

Class	Levels	Values
REP	2	a b
TRT	6	I II III IV cont solv

Number of observations in data set = 148

Group	Obs	Dependent Variables
1	121	MLNGTH MWGHT
2	129	FLNGTH FWGHT

NOTE: Variables in each group are consistent with respect to the presence or absence of missing values.

ANALYSIS USING TRT*REP INTERACTION AS THE ERROR TERM
13:38 Tuesday, August 6, 1996

General Linear Models Procedure

Dependent Variable: MLNGTH

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	11	2.1363799	0.1942164	1.72	0.0786
Error	109	12.3237854	0.1130623		
Corrected Total	120	14.4601653			

R-Square	C.V.	Root MSE	MLNGTH Mean
0.147742	4.746375	0.3362	7.0843

Source	DF	Type I SS	Mean Square	F Value	Pr > F
REP	1	0.0002638	0.0002638	0.00	0.9616
TRT	5	1.2288377	0.2457675	2.17	0.0622
REP*TRT	5	0.9072785	0.1814557	1.60	0.1648

Source	DF	Type III SS	Mean Square	F Value	Pr > F
REP	1	0.0040593	0.0040593	0.04	0.8501
TRT	5	0.8922446	0.1784489	1.58	0.1722
REP*TRT	5	0.9072785	0.1814557	1.60	0.1648

Tests of Hypotheses using the Type III MS for REP*TRT as an error term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
TRT	5	0.8922446	0.1784489	0.98	0.5071

ANALYSIS USING TRT*REP INTERACTION AS THE ERROR TERM
13:38 Tuesday, August 6, 1996

General Linear Models Procedure

Dependent Variable: MWGHT

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F

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Model	11	0.2948553	0.0268050	1.83	0.0577
Error	109	1.5984968	0.0146651		
Corrected Total	120	1.8933521			

R-Square	C.V.	Root MSE	MWGHT Mean
0.155732	14.45644	0.1211	0.8377

Source	DF	Type I SS	Mean Square	F Value	Pr > F
REP	1	0.0178510	0.0178510	1.22	0.2723
TRT	5	0.1743000	0.0348600	2.38	0.0434
REP*TRT	5	0.1027043	0.0205409	1.40	0.2297

Source	DF	Type III SS	Mean Square	F Value	Pr > F
REP	1	0.0093918	0.0093918	0.64	0.4253
TRT	5	0.1656858	0.0331372	2.26	0.0535
REP*TRT	5	0.1027043	0.0205409	1.40	0.2297

Tests of Hypotheses using the Type III MS for REP*TRT as an error term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
TRT	5	0.1656858	0.0331372	1.61	0.3062

ANALYSIS USING TRT*REP INTERACTION AS THE ERROR TERM
13:38 Tuesday, August 6, 1996

General Linear Models Procedure
Least Squares Means

Standard Errors and Probabilities calculated using the Type III MS for REP*TRT as an Error term

TRT	MLNGTH LSMEAN	Pr > |T| HO: LSMEAN(i)=LSMEAN(j) i/j	1	2	3	4	5	6
I	7.10055556	1	.	0.3783	0.8366	0.2711	0.8180	0.9791
II	7.24444444	2	0.3783	.	0.4741	0.0872	0.2766	0.3686
III	7.13030303	3	0.8366	0.4741	.	0.2014	0.6576	0.8478
IV	6.93125000	4	0.2711	0.0872	0.2014	.	0.3469	0.2388
cont	7.06818182	5	0.8180	0.2766	0.6576	0.3469	.	0.7862
solv	7.10416667	6	0.9791	0.3686	0.8478	0.2388	0.7862	.

Standard Errors and Probabilities calculated using the Type III MS for REP*TRT as an Error term

TRT	MWGHT LSMEAN	Pr > |T| HO: LSMEAN(i)=LSMEAN(j) i/j	1	2	3	4	5	6
I	0.76238889	1	.	0.2302	0.0391	0.1800	0.1373	0.1085
II	0.83083333	2	0.2302	.	0.2853	0.9495	0.8301	0.7291
III	0.89020202	3	0.0391	0.2853	.	0.2731	0.3255	0.3801
IV	0.83413462	4	0.1800	0.9495	0.2731	.	0.8694	0.7574
cont	0.84181818	5	0.1373	0.8301	0.3255	0.8694	.	0.8836
solv	0.84833333	6	0.1085	0.7291	0.3801	0.7574	0.8836	.

NOTE: To ensure overall protection level, only probabilities associated with pre-planned comparisons should be used.

ANALYSIS USING TRT*REP INTERACTION AS THE ERROR TERM
13:38 Tuesday, August 6, 1996

General Linear Models Procedure

Dunnett's One-tailed T tests for variable: MLNGTH

NOTE: This tests controls the type I experimentwise error for comparisons of all treatments against a control.

Alpha= 0.05 Confidence= 0.95 df= 5 MSE= 0.181456
Critical Value of Dunnett's T= 3.015

Comparisons significant at the 0.05 level are indicated by '***'.

TRT Comparison	Simultaneous Lower Confidence Limit	Difference Between Means	Simultaneous Upper Confidence Limit
II - solv	-0.2668	0.1558	0.5785
III - solv	-0.3730	0.0158	0.4046
I - solv	-0.3932	0.0011	0.3954
cont - solv	-0.4150	-0.0360	0.3431
IV - solv	-0.5879	-0.2042	0.1796

ANALYSIS USING TRT*REP INTERACTION AS THE ERROR TERM
13:38 Tuesday, August 6, 1996

General Linear Models Procedure

Dunnett's One-tailed T tests for variable: MWGHT

NOTE: This tests controls the type I experimentwise error for comparisons of all treatments against a control.

Alpha= 0.05 Confidence= 0.95 df= 5 MSE= 0.020541
Critical Value of Dunnett's T= 3.015

Comparisons significant at the 0.05 level are indicated by '***'.

TRT Comparison	Simultaneous Lower Confidence Limit	Difference Between Means	Simultaneous Upper Confidence Limit
III - solv	-0.08515	0.04567	0.17648
cont - solv	-0.13404	-0.00652	0.12101
II - solv	-0.15254	-0.01033	0.13188
IV - solv	-0.14172	-0.01262	0.11648
I - solv	-0.21891	-0.08623	0.04645

ANALYSIS USING TRT*REP INTERACTION AS THE ERROR TERM
13:38 Tuesday, August 6, 1996

General Linear Models Procedure

Dependent Variable: FLNGTH

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	11	1.1211719	0.1019247	0.89	0.5526
Error	117	13.4036343	0.1145610		
Corrected Total	128	14.5248062			

R-Square	C.V.	Root MSE	FLNGTH Mean

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0.077190	4.782305	0.3385		7.0775

Source	DF	Type I SS	Mean Square	F Value	Pr > F
REP	1	0.0082694	0.0082694	0.07	0.7887
TRT	5	0.6825882	0.1365176	1.19	0.3175
REP*TRT	5	0.4303143	0.0860629	0.75	0.5868

Source	DF	Type III SS	Mean Square	F Value	Pr > F
REP	1	0.0021742	0.0021742	0.02	0.8907
TRT	5	0.6914765	0.1382953	1.21	0.3101
REP*TRT	5	0.4303143	0.0860629	0.75	0.5868

Tests of Hypotheses using the Type III MS for REP*TRT as an error term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
TRT	5	0.6914765	0.1382953	1.61	0.3077

ANALYSIS USING TRT*REP INTERACTION AS THE ERROR TERM
13:38 Tuesday, August 6, 1996

General Linear Models Procedure

Dependent Variable: FWGHT

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	11	0.8695274	0.0790479	1.82	0.0584
Error	117	5.0878974	0.0434863		
Corrected Total	128	5.9574248			

R-Square	C.V.	Root MSE	FWGHT Mean
0.145957	21.76092	0.2085	0.9583

Source	DF	Type I SS	Mean Square	F Value	Pr > F
REP	1	0.0030309	0.0030309	0.07	0.7922
TRT	5	0.3904926	0.0780985	1.80	0.1190
REP*TRT	5	0.4760039	0.0952008	2.19	0.0600

Source	DF	Type III SS	Mean Square	F Value	Pr > F
REP	1	0.0093316	0.0093316	0.21	0.6441
TRT	5	0.4486850	0.0897370	2.06	0.0749
REP*TRT	5	0.4760039	0.0952008	2.19	0.0600

Tests of Hypotheses using the Type III MS for REP*TRT as an error term

Source	DF	Type III SS	Mean Square	F Value	Pr > F
TRT	5	0.4486850	0.0897370	0.94	0.5251

ANALYSIS USING TRT*REP INTERACTION AS THE ERROR TERM
13:38 Tuesday, August 6, 1996

General Linear Models Procedure
Least Squares Means

Standard Errors and Probabilities calculated using the Type III MS for REP*TRT as an Error term

TRT	FLNGTH LSMEAN	Pr > |T| HO: LSMEAN(i)=LSMEAN(j) i/j	1	2	3	4	5	6
I	7.13791209	1	.	0.4478	0.2719	0.4902	0.1645	0.2441
II	7.20833333	2	0.4478	.	0.1099	0.2510	0.0662	0.0992
III	7.03290598	3	0.2719	0.1099	.	0.8938	0.7778	0.9388
IV	7.05000000	4	0.4902	0.2510	0.8938	.	0.7340	0.8492
cont	7.00750000	5	0.1645	0.0662	0.7778	0.7340	.	0.8399
solv	7.02564103	6	0.2441	0.0992	0.9388	0.8492	0.8399	.

Standard Errors and Probabilities calculated using the Type III MS for REP*TRT as an Error term

TRT	FWGHT LSMEAN	Pr > |T| HO: LSMEAN(i)=LSMEAN(j) i/j	1	2	3	4	5	6
I	1.00453297	1	.	0.9369	0.9660	0.8887	0.1304	0.7456
II	0.99704167	2	0.9369	.	0.9084	0.9362	0.1691	0.8169
III	1.00854701	3	0.9660	0.9084	.	0.8685	0.1417	0.7288
IV	0.98625000	4	0.8887	0.9362	0.8685	.	0.3303	0.9265
cont	0.85216667	5	0.1304	0.1691	0.1417	0.3303	.	0.2329
solv	0.97384615	6	0.7456	0.8169	0.7288	0.9265	0.2329	.

NOTE: To ensure overall protection level, only probabilities associated with pre-planned comparisons should be used.

ANALYSIS USING TRT*REP INTERACTION AS THE ERROR TERM
13:38 Tuesday, August 6, 1996

General Linear Models Procedure

Dunnett's One-tailed T tests for variable: FLNGTH

NOTE: This tests controls the type I experimentwise error for comparisons of all treatments against a control.

Alpha= 0.05 Confidence= 0.95 df= 5 MSE= 0.086063
Critical Value of Dunnett's T= 2.996

Comparisons significant at the 0.05 level are indicated by '***'.

TRT Comparison	Simultaneous Lower Confidence Limit	Difference Between Means	Simultaneous Upper Confidence Limit
II - solv	-0.08461	0.17747	0.43955
I - solv	-0.13356	0.11886	0.37127
IV - solv	-0.33102	0.03182	0.39466
III - solv	-0.26044	0.00455	0.26953
cont - solv	-0.25208	0.00034	0.25275

ANALYSIS USING TRT*REP INTERACTION AS THE ERROR TERM
13:38 Tuesday, August 6, 1996

General Linear Models Procedure

Dunnett's One-tailed T tests for variable: FWGHT

NOTE: This tests controls the type I experimentwise error for comparisons of all treatments against a control.

Alpha= 0.05 Confidence= 0.95 df= 5 MSE= 0.095201
Critical Value of Dunnett's T= 2.996

Comparisons significant at the 0.05 level are indicated by '***'.

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TRT Comparison	Simultaneous Lower Confidence Limit	Difference Between Means	Simultaneous Upper Confidence Limit
I - solv	-0.23780	0.02768	0.29315
III - solv	-0.25324	0.02545	0.30415
IV - solv	-0.36991	0.01170	0.39332
II - solv	-0.28715	-0.01150	0.26415
cont - solv	-0.38521	-0.11973	0.14575

9-3-96

MRID No. 439048-22

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

1. **CHEMICAL:** Isoxaflutole PC Code No.: 123000

2. **TEST MATERIAL:** RPA 202248 Purity: 99.9%

3. **CITATION:**

Author: A. Mc Elligott
Title: RPA 202248: Acute Toxicity (96 Hours) to Rainbow Trout (*Oncorhynchus mykiss*) Under Semi-Static Conditions
Study Completion Date: November 3, 1995
Laboratory: Rhône-Poulenc Agrochimie, Centre de Recherche, Sophia Antipolis, France
Sponsor: Rhône-Poulenc Agrochimie, Lyon, France
Laboratory Report ID: SA 95141
MRID No.: 439048-22
DP Barcode: D222982

4. **REVIEWED BY:** Max A. Feken, M.S., Environmental Toxicologist, KBN Engineering and Applied Sciences, Inc.,

Signature: Max Feken **Date:** 8/8/96

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

Signature: P. Kosalwat **Date:** 8/8/96

5. **APPROVED BY:**

Signature: Rene Costello **Date:** 9/3/96

6. **STUDY PARAMETERS:**

Age or Size of Test Organism: Average of 1.1 g
Definitive Test Duration: 96 hours
Study Method: Static renewal
Type of Concentrations: Mean measured

7. **CONCLUSIONS:** This study is scientifically sound and meets the guideline requirements for an acute toxicity test using a freshwater fish. The 96-hour LC_{50} for rainbow trout exposed to RPA 202248 was >30.6 ppm, the solubility limit of this compound under the conditions of this test. The test material is classified, at worst, as slightly toxic to rainbow trout.

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Results Synopsis

LC_{50}: >30.6 ppm 95% C.I.: N/A

NOEC: 30.6 ppm Probit Slope: N/A

8. ADEQUACY OF THE STUDY

A. Classification: Core

B. Rationale: Although the highest test concentration was lower than 100 ppm and a more precise LC_{50} was not obtained, the test was apparently conducted at the water solubility limit for this test material under the conditions of the test.

C. Repairability: N/A

9. GUIDELINE DEVIATIONS:

1. Tap water filtered through activated charcoal was used to prepare the test solutions. The guidelines discourage the use of dechlorinated water since removal of chlorine is rarely complete. However, no control mortality occurred in this test.

2. Each test concentration was 50% of the next highest concentration; 60% is recommended by the SEP.

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 0.5-5.0 g	1.1 g
Mean Standard Length Longest not > 2x shortest	Mean (total length): 5.0 cm Range: 4.5 - 5.3 cm
Supplier	Pisciculture TALLET, Saumane, France

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Guideline Criteria	Reported Information
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	At least 14 days
Wild caught organisms were quarantined for 7 days?	N/A
Were there signs of disease or injury?	None
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	Fish were not fed during the study
Pretest Mortality < 3% mortality 48 hours prior to testing	2.3% mortality in stock culture during the 7 days prior to testing.

C. Test System

Guideline Criteria	Reported Information
Source of dilution water Soft reconstituted water or water from a natural source, **not** dechlorinated tap water	Activated-charcoal filtered tap water diluted with deionized water
Does water support test animals without observable signs of stress?	Yes
Water Temperature 12°C	11.9 - 13.0°C
pH Prefer 7.2 to 7.6	6.7 - 7.7

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Guideline Criteria	Reported Information
Dissolved Oxygen Static: ≥ 60% during 1st 48 hrs and ≥ 40% during 2nd 48 hrs, flow-through: ≥ 60%	>74% for the entire test
Total Hardness Prefer 40 to 200 mg/L as $CaCO_3$	39-40 mg/L as $CaCO_3$.
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	1. Glass 2. 30 L 3. 20 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 ≤ 17°C, ≤ 0.5 g/L at > 17°C; flow-through: ≤ 1 g/L/day	0.56 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	Dimethyl-formamide (0.1 mg/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.	Yes; 0.3, 1.0, 3.1, 10.0, and 32.0 mg/L. No mortality or adverse effects were observed at any concentration. The highest concentration (32.0 mg/L) was above the visual limit of aqueous solubility of the test compound.
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, solvent control, 3.8, 7.5, 15, 30, and 60 mg/L.
Number of Test Organisms Minimum 10/level, may be divided among containers	20 per treatment level; 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 was measured continuously in one test aquarium and every 24 hrs at each treatment level. DO and pH were measured every 24 hrs at all dose levels.
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	Chemical analysis was performed on all fresh and old (48 hrs) test solutions and controls at test initiation and every 48 hrs.

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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	Analytical: 97-102% Test: 97-105% (14-99% for the highest treatment level)
Control Mortality Not more than 10% control organisms may die or show abnormal behavior.	0% mortality
Raw data included?	Yes
Signs of toxicity (if any) were described?	Yes

Mortality

Concentration (mg/L)		Number of Fish	Cumulative Number Dead			
			Hour of Study			
Nominal	Mean Measured		24	48	72	96
Control	--	20	0	0	0	0
Solvent	--	20	0	0	0	0
3.8	3.9	20	0	0	0	0
7.5	7.7	20	0	0	0	0
15.0	15.0	20	0	0	0	0
30.0	30.6	20	0	0	0	0
60.0	33.8	20	0	0	0	0

Other Significant Results: Undissolved particles were observed on the bottom of the 30 mg/L and 60 mg/L test aquaria. All particles had solubilized by the end of each 48-hour exposure period at the 30 mg/L level. Particles remained present in both replicates of the highest treatment

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level (60 mg/L) throughout the test. Occasional signs of lethargy and pigmentation effects were observed in some fish at most of the test levels and controls.

B. Statistical Results

Method: Visual inspection

96-hr LC_{50}: >33.8 mg/L 95% C.I.: N/A

Probit Slope: N/A NOEC: 33.8 mg/L

13. VERIFICATION OF STATISTICAL RESULTS:

Method: Visual inspection

96-hr LC_{50}: >30.6 mg/L 95% C.I.: N/A

Probit Slope: N/A NOEC: 30.6 mg/L

14. REVIEWER'S COMMENTS: Percent recovery of the test material at the highest treatment level ranged from 13.8 to 99.0%. Since insoluble fragments of test compound remained throughout the test period, the nominal concentration of 60.0 mg/L was obviously well above the limit of solubility for this compound under these test conditions. Undissolved test material was also present throughout the test period in the highest concentration. The 30.0 mg/L nominal concentration was approximately equal to the limit of solubility and was subsequently treated as the highest test level by the reviewer.

This study is scientifically sound and meets the guideline requirements for an acute freshwater fish toxicity test. The 96-hour LC_{50} for rainbow trout exposed to RPA 202248 was >30.6 ppm, the limit of solubility for this compound under the conditions of this test. The test material is classified, at worst, as slightly toxic to rainbow trout. The NOEC was determined to be 30.6 ppm. This study is classified as **Core.**

D 36

9-3-96

MRID No.: 439048-23

DATA EVALUATION RECORD
§ 72-2 - ACUTE LC_{50} TEST WITH A FRESHWATER INVERTEBRATE

1. **CHEMICAL:** Isoxaflutole — PC Code No.: 123000

2. **TEST MATERIAL:** RPA 202248 — Purity: 99.9%

3. **CITATION:**

Author:	A. Mc Elligott
Title:	RPA 202248: Acute Toxicity (48 Hours) to Daphnids (*Daphnia magna*) Under Semi-Static Conditions
Study Completion Date:	November 30, 1995
Laboratory:	Rhône-Poulenc Agrochimie, Centre de Recherche, Sophia Antipolis, France
Sponsor:	Rhône-Poulenc Agrochimie, Lyon, France
Laboratory Report ID:	SA 95142
MRID No.:	439048-23
DP Barcode:	D222982

4. **REVIEWED BY:** Max Feken, M.S., Environmental Toxicologist, KBN Engineering and Applied Sciences, Inc.,

Signature: Max Feken **Date:** 8/8/96

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

Signature: P. Kosalwat **Date:** 8/8/96

5. **APPROVED BY:**

Signature: Renée Costello **Date:** 9/13/96

6. **STUDY PARAMETERS:**

Age of Test Organism:	<24 hours
Definitive Test Duration:	48 hours
Study Method:	Static renewal
Type of Concentrations:	Mean measured

7. **CONCLUSIONS:** This study is scientifically sound and fulfills the guideline requirements for an acute toxicity study using freshwater invertebrates. The 96-hour LC_{50} for *Daphnia magna* exposed to RPA 202248 was >59.6 ppm, the limit of solubility for this compound under the conditions of this test. The test material is classified, at worst, as slightly toxic to *Daphnia magna*.

A.75

Results Synopsis

EC_{50}: >59.6 ppm 95% C.I.: N/A

NOEC: 59.6 ppm Probit Slope: N/A

8. **ADEQUACY OF THE STUDY:**

A. Classification: Core

B. Rationale: Although the highest test concentration was less than 100 ppm and a more precise EC_{50} was not determined, the test was apparently conducted at the maximum water solubility of the test compound under the conditions of this test.

C. Repairability: N/A

9. **GUIDELINE DEVIATIONS:** No significant deviations.

10. **SUBMISSION PURPOSE:**

11. **MATERIALS AND METHODS:**

A. Test Organisms:

Guideline Criteria	Reported Information
Species Preferred species is *Daphnia magna*	*Daphnia magna*
All organisms are approximately the same size and weight?	Not reported
Life Stage Daphnids: 1st instar (<24 h). Amphipods, stoneflies, and mayflies: 2nd instar. Midges: 2nd & 3rd instar.	1st instar (<24 h)
Supplier	In-house cultures
All organisms from the same source?	Yes

B. **Source/Acclimation:**

Guideline Criteria	Reported Information
Acclimation Period Minimum 7 days	N/A
Wild caught organisms were quarantined for 7 days?	N/A
Were there signs of disease or injury?	Not reported
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.	No feeding
Pretest Mortality No more than 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.	Reconstituted hard water prepared from a reverse-osmosed, de-ionized water which was also filtered through activated charcoal
Does water support test animals without observable signs of stress?	Yes
Water Temperature Daphnia: 20°C Amphipods and mayflies: 17°C Midges and mayflies: 22°C Stoneflies: 12°C	19.3 - 20.8°C
pH Prefer 7.2 to 7.6.	7.2 - 7.9

Guideline Criteria	Reported Information
Dissolved Oxygen Static: ≥ 60% during 1st 48 h and ≥ 40% during 2nd 48 h, flow-through: ≥ 60%.	>93% throughout test
Total Hardness Prefer 40 to 200 mg/L as $CaCO_3$.	170 - 172 mg/L as $CaCO_3$
Test Aquaria 1. Material: Glass or stainless steel. 2. Size: 250 mL (daphnids and midges) or 3.9 L (1 gal). 3. Fill volume: 200 mL (daphnids and midges) or 2-3 L.	 Glass 250 mL 200 mL
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 ≤ 17°C, ≤ 0.5 g/L at > 17°C; flow-through: ≤ 1 g/L/day.	1 daphnid/20 mL
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.	Dimethyl formamide (0.1 mL/L)

D. **Test Design:**

Guideline Criteria	Reported Information
Range Finding Test If LC_{50} >100 mg/L, then no definitive test is required.	Yes; however, the concentration range was not reported. EC_{50} was >50 mg/L.
Nominal Concentrations of Definitive Test Control & 5 treatment levels; a geometric series with each concentration being at least 60% of the next higher one.	Control, solvent control, 3.8, 7.5, 15.0, 30.0, and 60.0 mg/L.
Number of Test Organisms Minimum 20/level, may be divided among containers.	20 per treatment, 10 per replicate.
Test organisms randomly or impartially assigned to test vessels?	Yes
Water Parameter Measurements 1. Temperature Measured continuously or, if water baths are used, every 6 h, 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, DO, and pH were measured initially, at the end of 24 h, and at test termination (48-h) for each treatment level. Temperature was also measured continuously in a dilution water sample located in the test area.
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	Fresh and old test solutions were measured initially, after 24 hours, and at test termination for each treatment level and controls.

12. REPORTED RESULTS:

Guideline Criteria	Reported Information
Quality assurance and GLP compliance statements were included in the report?	Yes
Control Mortality Static: ≤10% Flow-through: ≤5%	0% mortality
Percent Recovery of Chemical	Analytical: 97-102% Test: 97-111%
Raw data included?	Yes

Mortality

Concentration (mg/L)		Number of Daphnids	Cumulative Number Dead	
			Hour of Study	
Nominal	Mean Measured		24	48
Control	<0.2	20	0	0
Solvent	<0.2	20	0	0
3.8	4.2	20	0	0
7.5	7.6	20	0	0
15.0	15.0	20	0	1
30.0	30.1	20	0	0
60.0	59.6	20	0	0

Other Significant Results: Undissolved particles were observed in test solutions at the 60 mg/L treatment level during each 24-hour cycle of exposure.

B. Statistical Results

Method: Visual inspection

48-hr EC_{50}: >59.6 mg/L 95% C.I.: N/A

Probit Slope: N/A NOEC: 59.6 mg/L

13. VERIFICATION OF STATISTICAL RESULTS:

Method: Visual inspection

48-hr EC_{50}: >59.6 mg/L 95% C.I.: N/A

Probit Slope: N/A NOEC: 59.6 mg/L

14. REVIEWER'S COMMENTS: This study is scientifically sound, fulfills the guideline requirements for an acute toxicity study using freshwater invertebrates, and is classified as **Core.** The 96-hour LC_{50} for *Daphnia magna* exposed to RPA 202248 was >59.6 ppm, the limit of solubility for this compound under the conditions of this test. The test material is classified, at worst, as slightly toxic to *Daphnia magna*. The NOEC was determined to be 59.6 ppm.

9-3-96

MRID No. 439048-24

DATA EVALUATION RECORD
§ 72-3 - ACUTE LC_{50} TEST WITH AN ESTUARINE/MARINE SHRIMP

1. **CHEMICAL:** Isoxaflutole — PC Code No.: 123000

2. **TEST MATERIAL:** RPA 202248 — Purity: 99.9%

3. **CITATION:**

Author:	Maura K. Collins
Title:	RPA 202248 - Acute Toxicity to Mysids (*Mysidopsis bahia*) Under Static Renewal Conditions
Study Completion Date:	December 22, 1995
Laboratory:	Springborn Laboratories, Inc., Wareham, MA
Sponsor:	Rhône-Poulenc Secteur Agro, Sophia Antipolis, France
Laboratory Report ID:	95-12-6271
MRID No.:	439048-24
DP Barcode:	D222982

4. **REVIEWED BY:** Max Feken, M.S., Environmental Toxicologist, KBN Engineering and Applied Sciences, Inc.

Signature: [signature] **Date:** 8/8/96

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

Signature: P. Kosalwat **Date:** 8/8/96

5. **APPROVED BY:**

Signature: Renée Costello **Date:** 9/3/96

6. **STUDY PARAMETERS:**

Definitive Test Duration:	96 hours
Study Method:	Static Renewal
Type of Concentrations:	Mean Measured

7. **CONCLUSIONS:** This study is scientifically sound and fulfills the guideline requirements. The 96-hour LC_{50} for mysid shrimp exposed to RPA 202248 was 3.6 ppm ai, which classifies RPA 202248 as moderately toxic to *Mysidopsis bahia*. The NOEC was determined to be 0.83 ppm ai.

Results Synopsis

LC_{50}: 3.6 ppm ai 95% C.I.: 0.83 - 7.4 ppm ai

NOEC: 0.83 ppm ai Probit Slope: N/A

8. ADEQUACY OF THE STUDY:

A. Classification: Core

B. Rationale: N/A

C. Repairability: N/A

9. GUIDELINE DEVIATIONS:

1. The size of the test vessels (2.0 L) was less than recommended (3.9 L).

2. The temperature of the test solutions (24-26°C) was higher than recommended (22°C).

10. SUBMISSION PURPOSE:

11. MATERIALS AND METHODS:

A. Test Organisms

Guideline Criteria	Reported Information
Species Preferred species are *Mysidopsis bahia*, *Penaeus setiferus*, *P. duorarum*, *P. aztecus* and *Palaemonetes sp.*	*Mysidopsis bahia*
Age Juvenile, mysids should be ≤ 24 hours old	≤ 24 hours old (from protocol; p.34)
Supplier	Springborn Laboratories, Inc., Wareham, MA
All shrimp are from same source?	Yes
All shrimp are from the same year class?	Yes

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B. Source/Acclimation

Guideline Criteria	Reported Information
Acclimation Period minimum 10 days	N/A
Wild caught organisms were quarantined for 7 days?	N/A
Were there signs of disease or injury?	None reported
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 and no feeding for 24 hours before the beginning of the test if organisms are over 0.5 g each.	Mysids were fed brine shrimp nauplii daily during the exposure period.
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	Filtered seawater with the salinity adjusted to approximately 19 ‰ using well water.
Does water support test animals without observable signs of stress?	Yes
Salinity 30-34 ‰ for marine (stenohaline) shrimp and 10-17 ‰ for estuarine (euryhaline) shrimp, weekly range < 6%	18-21 ‰
Water Temperature Approx. 22 ± 1 °C	24-26°C

Guideline Criteria	Reported Information
pH 8.0-8.3 for marine (stenohaline) shrimp, 7.7-8.0 for estuarine (euryhaline) shrimp, monthly range < 0.8	7.2-7.7
Dissolved Oxygen Static: ≥ 60% during 1st 48 hrs and ≥ 40% during 2nd 48 hrs, Flow-through: ≥ 60%	≥ 62% during 1st 48 hrs and ≥ 51% during 2nd 48 hrs
Total Organic Carbon	0.40 mg/L
Test Aquaria 1. Material: Glass or stainless steel 2. Size: 19.6 L is acceptable for organisms ≥ 0.5 g (e.g. pink shrimp, white shrimp, and brown shrimp), 3.9 L is acceptable for smaller organisms (e.g. mysids and grass shrimp). 3. Fill volume: 15 L is acceptable for organisms ≥ 0.5 g, 2-3 L is acceptable for smaller organisms.	1. Glass 2. 2.0 L 3. Fill volume of 1 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 ≤ 17°C, ≤ 0.5 g/L at > 17°C; flow-through: ≤ 1 g/L/day	1 mysid/100 ml
Photoperiod 16 hours light, 8 hours dark	16 h light, 8 h dark

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Guideline Criteria	Reported Information
Solvents Not to exceed 0.5 mL/L for static tests or 0.1 mL/L for flow-through tests	Solvent: acetone Maximum conc.: 0.25 mL/L

D. Test Design

Guideline Criteria	Reported Information
Range Finding Test If LC_{50} >100 mg/L with 30 shrimp, then no definitive test is required.	1.0, 10, 40 and 100 mg ai/L; undissolved test material was observed in 10, 40, and 100 mg ai/L solutions. These same concentration levels had 40, 70, and 70% mortality, respectively. No mortality was observed at the 1.0 mg ai/L level.
Nominal Concentrations of Definitive Test Control & 5 treatment levels; a geometric series in which each concentration is at least 60% of the next higher one.	Control, solvent control, 1.0, 5.2, 8.6, 14, 24 and 40 mg ai/L.
Number of Test Organisms Minimum 20/level, may be divided among containers	20 per level, 10 per replicate
Test organisms randomly or impartially assigned to test vessels?	Mysids impartially distributed by twos to each vessel.
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	1. Temperature measured continuously in the water bath and daily in each test vessel. 2. DO and pH were measured daily in each test vessel.

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Guideline Criteria	Reported Information
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, fresh and old test solutions were analyzed at test initiation, after 48 hours, and at termination.

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	75-87%
Control Mortality Not more than 10% of control organisms may die or show abnormal behavior.	0% in negative control and 5% in solvent control.
Raw data included?	Yes
Signs of toxicity (if any) were described?	Yes

Mortality

Concentration (mg ai/L)		Number of Shrimp	Cumulative Number Dead			
Nominal	Mean Measured		Hour of Study			
			24	48	72	96
Control	<0.51	20	0	0	0	0
Solvent	<0.51	20	0	0	0	1
1.0	0.83	20	0	0	0	0
5.2	4.5	20	0	0	0	12
8.6	7.4	20	0	3	14	20

Concentration (mg ai/L)		Number of Shrimp	Cumulative Number Dead			
Nominal	Mean Measured		Hour of Study			
			24	48	72	96
14	11	20	0	6	17	19
24	20	20	0	9	17	19
40	33	20	3	11	17	20

Other Significant Results: Some undissolved test material was observed in the 11, 20, and 33 mg ai/L test solutions throughout the exposure period.

B. Statistical Results

Method: Nonlinear interpolation

96-hr LC_{50}: 3.7 mg ai/L 95% C.I.: 0.83 - 7.4 mg ai/L

Probit Slope: N/A NOEC: 0.83 mg ai/L

13. VERIFICATION OF STATISTICAL RESULTS:

Parameter	Result
Binomial Test LC_{50} (C.I.)	3.6 (0.83 - 7.4) ppm ai
Moving Average Angle LC_{50} (95% C.I.)	N/A
Probit LC_{50} (95% C.I.)	N/A
Probit Slope	N/A
NOEC	0.83 ppm ai

14. REVIEWER'S COMMENTS: This study is scientifically sound and meets the guideline requirements for an acute toxicity test using *Mysidopsis bahia*. Based on mean measured concentrations, the 96-hour LC_{50} was 3.6 ppm ai, which classifies RPA 202248 as moderately toxic to mysid shrimp. This study is classified as **Core**.

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NOTE: THERE WAS CONTROL MORTALITY, BUT AT LEAST ONE
OF THE LOWER CONCENTRATIONS HAD ZERO MORTALITY.
THEREFORE, ABBOTT'S CORRECTION IS NOT APPLICABLE.

MAX FEKEN RPA 202248 MYSIDOPSIS 07-31-96

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CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB.(PERCENT)
7.4	20	20	100	9.536742E-05
4.5	20	12	60.00001	25.17223
.83	20	0	0	9.536742E-05

THE BINOMIAL TEST SHOWS THAT .83 AND 7.4 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 3.646719

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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9-3-96

MRID No. 439048-25

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

1. **CHEMICAL:** Isoxaflutole PC Code No.: 123000

2. **TEST MATERIAL:** RPA 203328 Purity: 98.9%

3. **CITATION:**

Author: Mark W. Machado
Title: RPA 203328 - Acute Toxicity to Rainbow Trout (*Oncorhynchus mykiss*) Under Flow-Through Conditions
Study Completion Date: June 22, 1995
Laboratory: Springborn Laboratories, Inc., Wareham, MA
Sponsor: Rhône-Poulenc Ag Company, Research Triangle Park, NC
Laboratory Report ID: 95-5-5861
MRID No.: 439048-25
DP Barcode: D222982

4. **REVIEWED BY:** Max A. Feken, M.S., Environmental Toxicologist, KBN Engineering and Applied Sciences, Inc.,

Signature: [signature] **Date:** 8/8/96

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

Signature: P. Kosalwat **Date:** 8/8/96

5. **APPROVED BY:**

Signature: Ronee Costello **Date:** 9/3/96

6. **STUDY PARAMETERS:**

Age or Size of Test Organism: Average of 0.59 g
Definitive Test Duration: 96 hours
Study Method: Flow-Through
Type of Concentrations: Mean measured

7. **CONCLUSIONS:** This study is scientifically sound and meets the guideline requirements for an acute toxicity test using a freshwater fish. The 96-hour LC_{50} for rainbow trout exposed to RPA 203328 was 160 ppm ai, which classifies this compound as practically non-toxic to *Oncorhynchus mykiss*.

5.75

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Results Synopsis

LC_{50}: 160 ppm ai 95% C.I.: 130 - 210 ppm ai

NOEC: 130 ppm ai Probit Slope: N/A

8. ADEQUACY OF THE STUDY:

A. Classification: Core

B. Rationale: N/A

C. Repairability: N/A

9. GUIDELINE DEVIATIONS:

1. The pH of the test solutions (3.4 - 7.1) was lower than recommended (7.2 - 7.6).

2. The concentration of solvent in the solvent control and treatment solutions (0.5 mL/L) was greater than recommended (0.1 mL/L) for a flow-through test.

3. The size of the aquaria (39 x 20 x 25 cm) in this test was smaller than recommended (30 x 60 x 30 cm).

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 0.5-5.0 g	0.59 g
Mean Standard Length Longest not > 2x shortest	Mean (total length): 41 mm Range: 35 - 45 mm
Supplier	Blue Stream Trout Hatchery, Barnstable, MA
All fish from same source?	Yes

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Guideline Criteria	Reported Information
All fish from the same year class?	Yes

B. Source/Acclimation

Guideline Criteria	Reported Information
Acclimation Period Minimum 14 days	At least 14 days
Wild caught organisms were quarantined for 7 days?	N/A
Were there signs of disease or injury?	None
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	Fish were not fed during the study
Pretest Mortality < 3% mortality 48 hours prior to testing	0.14% mortality in the test fish population during 48 hours prior to testing.

C. Test System

Guideline Criteria	Reported Information
Source of dilution water Soft reconstituted water or water from a natural source, **not** dechlorinated tap water	Soft well water periodically sampled and analyzed for contaminants
Does water support test animals without observable signs of stress?	Yes
Water Temperature 12°C	11 - 13°C

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Guideline Criteria	Reported Information
pH Prefer 7.2 to 7.6	Controls: 7.2 - 7.6 26 mg ai/L: 6.8 - 7.1 43 mg ai/L: 6.7 - 7.0 72 mg ai/L: 6.4 - 7.3 120 mg ai/L: 4.6 - 6.5 200 mg ai/L: 3.4 - 3.8
Dissolved Oxygen Static: ≥ 60% during 1st 48 hrs and ≥ 40% during 2nd 48 hrs, flow-through: ≥ 60%	≥80% for the entire test
Total Hardness Prefer 40 to 200 mg/L as $CaCO_3$	32-38 mg/L as $CaCO_3$.
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	 1. Glass 2. 39 x 20 x 25 cm 3. 11 L
Type of Dilution System Must provide reproducible supply of toxicant	Intermittent-flow proportional diluter
Flow Rate Consistent flow rate of 5-10 vol/24 hours, meter systems calibrated before study and checked twice daily during test period	6.9 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	0.078 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	Acetone (0.5 mL/L)

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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; 26, 43, 72, 120, and 200 mg ai/L. All fish died at the highest level (200 mg ai/L). No mortality or adverse effects were observed at any other concentration.
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, solvent control, 26, 43, 72, 120, and 200 mg ai/L.
Number of Test Organisms Minimum 10/level, may be divided among containers	20 per treatment level; 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 was measured continuously in one replicate of the control and every 24 hrs at each treatment level. DO and pH were measured every 24 hrs at all dose levels.
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	Chemical analysis was performed on all test solutions and controls at test initiation and termination.

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	101-118%
Control Mortality Not more than 10% control organisms may die or show abnormal behavior.	0% mortality
Raw data included?	Yes
Signs of toxicity (if any) were described?	Yes

Mortality

Concentration (mg ai/L)		Number of Fish	Cumulative Number Dead			
			Hour of Study			
Nominal	Mean Measured		24	48	72	96
Control	<4.7	20	0	0	0	0
Solvent	<4.7	20	0	0	0	0
26	31	20	0	0	0	0
43	43	20	0	0	0	0
72	74	20	0	0	0	0
120	130	20	0	0	0	0
200	210	20	20	20	20	20

Other Significant Results: Complete mortality was observed at the highest treatment level (210 mg ai/L). No mortality or adverse effects were observed among fish exposed to the remaining treatment levels (31, 43, 74, and 130 mg ai/L) after 96 hours. The pH of the test solutions at the highest treatment level remained consistently low (3.4 - 3.8) throughout the test. A pH of <4.0 is considered lethal to

many freshwater fish according to EPA's "A review of the Red Book: Quality Criteria for Water" (April 1979).

B. Statistical Results

Method: Nonlinear interpolation

96-hr LC_{50}: 160 mg ai/L 95% C.I.: 130 - 210 mg ai/L

Probit Slope: N/A NOEC: 130 mg ai/L

13. VERIFICATION OF STATISTICAL RESULTS:

Method: Binomial test

96-hr LC_{50}: 165 mg ai/L 95% C.I.: 130 - 210 mg ai/L

Probit Slope: N/A NOEC: 130 mg ai/L

14. REVIEWER'S COMMENTS: The mortality associated with the highest treatment level was probably a result of the extremely low pH measured in the replicate solutions and not directly due to the test material. However, no mortalities or treatment related effects were observed in fish at a concentration (130 mg ai/L) greater than the maximum concentration required (100 mg/L) for a fish acute toxicity test.

This study is scientifically sound and meets the guideline requirements for an acute freshwater fish toxicity test. The 96-hour LC_{50} for rainbow trout exposed to RPA 203328 was 165 ppm ai, which classifies this compound as practically non-toxic to *Oncorhynchus mykiss*. The NOEC was determined to be 130 ppm ai. This study is classified as **Core.**

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MAF RPA 203328 ONCORHYNCHUS MYKISS 08-05-96

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CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB. (PERCENT)
210	20	20	100	9.536742E-05
130	20	0	0	9.536742E-05
74	20	0	0	9.536742E-05
43	20	0	0	9.536742E-05
31	20	0	0	9.536742E-05

THE BINOMIAL TEST SHOWS THAT 130 AND 210 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 165.227

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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