

US EPA ARCHIVE DOCUMENT

DATA EVALUATION RECORD

9-12-86

5

1. Chemical: PP 321
2. Test Material: PP 321, 98% ai
3. Study/Action Type: Fish 96-hr Acute Study - Continuous Flow Rainbow Trout
4. Study ID: PP 321: Determination of acute toxicity to rainbow trout (Salmo gairdneri), R.W. Hill, ICI, August 1984, EPA Accession No. 259807.

5. Reviewed By: Ann Stavola
Aquatic Biologist
EEB/HED

Signature: *Ann Stavola*

Date: *Sept 5, 1986*

6. Approved By: Doug Urban
Supervisory Biologist
EEB/HED

Signature: *Douglas Urban*

Date: *9/12/86*

7. Conclusions:

The study is scientifically sound and meets EPA Guidelines requirement for acute toxicity testing with coldwater fish. With an 96-hr LC₅₀ value of 0.24 (0.08-0.70) ug/L technical PP 321 is very highly toxic to coldwater fish.

8. Recommendations: N/A.

9. Background:

This study was submitted to support the application for an EUP for Karate 1 EC Insecticide.

10. Materials and Methods:

- a. Test Animals: Rainbow trout (Salmo gairdneri)
obtained brood stock:

Weight = 0.83 g, range = 0.30 to 1.48 g.
Length = 38.3 mm, range = 29 to 48 mm.

- b. Dosage: PP 321, 98% ai. Stock concentrations made with acetone and deionized water. Dilution water - hardness = 72.4 ppm CaCO₃ and conductivity = 165. Continuous flowthrough system with a renewal rate of 200 mL/min and 95 percent exchange of test solutions within 4.5 hours. Concentrations were measured by GC.

- c. Study Design: The test was conducted in 20 L glass vessels. The measured concentrations were: fw control, solvent control, 0.03, 0.07, 0.11, 0.21, 0.37, and 0.63 ug PP 321/L. There were 20 fish per concentration. The fish were acclimatized in the test vessels for 2 days at the test temperature of 12 °C prior to the initiation of the test.

- d. Statistical Analysis: The data were analyzed with Finney's probit analysis.

11. Report Results:

Nominal Conc. (ug/L)	Measured Conc. (ug/L)	% Mortality			
		24h	48h	72h	96h
1.0	0.63	80	100	100	100
0.56	0.37	5	35	90	100
0.32	0.21	0	0	5	100
0.18	0.11	0	0	0	0
0.10	0.07	0	0	5	5
0.056	0.03	0	0	0	0
Acetone Control	-	0	0	0	0
FW Control	-	0	0	0	0

Time	LC ₅₀ (ug/L)	95% ci (Based on measured concentrations)
24h	0.52	(0.46-0.60)
48h	0.40	(0.35-0.45)
72h	0.27	(0.09-0.80)
96h	0.24	(0.08-0.70)

DO levels ranged from 10.2 to 11.2 mg/L in the fish exposure vessels. The pH values ranged from 7.7 to 7.9 in the exposure vessels.

The general symptoms of toxicity in the fish exposed to PP 321 were loss of equilibrium, quiescence, darkening in color, spiraling and rapid respiration rates. These symptoms generally occurred more frequently in fish exposed to 0.21 $\mu\text{g/L}$ and greater.

12. Study Author's Conclusions/QA Measures:

The 96-hr LC_{50} for PP 321 to rainbow trout is 0.24 (0.08-0.70) $\mu\text{g/L}$. The study followed Good Laboratory Practices.

13. Reviewer's Discussion:

- a. Test Procedure: The protocol used in this study basically follows Methods for Acute Toxicity Tests With Fish, Macroinvertebrates and Amphibians, EPA-660/3-75-009.
- b. Statistical Analysis: The data were analyzed using EEB's "Aquatox Program." The 96-hr LC_{50} value was computed to be 0.24 (0.20-0.29) $\mu\text{g/L}$ with the moving average method.
- c. Discussion/Results: The data indicate that PP 321 is very highly toxic to coldwater fish.
- d. Conclusions:
 1. Category: Core.
 2. Rationale: The study is scientifically sound and meets EPA Guidelines requirement for acute toxicity testing with coldwater fish.

STAVOLA PP321 RAINBOW TROUT ACUTE 96 HR

CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB. (PERCENT)
.63	20	20	100	9.536742E-05
.37	20	20	100	9.536742E-05
.21	20	2	10	2.012253E-02
.11	20	0	0	9.536742E-05
.07	20	1	5	2.002716E-03
.03	20	0	0	9.536742E-05

THE BINOMIAL TEST SHOWS THAT .21 AND .37 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 .2621484

RESULTS CALCULATED USING THE MOVING AVERAGE METHOD

SPAN	G	LC50	95 PERCENT CONFIDENCE LIMITS	
4	.0575314	.2374066	.1986414	.2878057

RESULTS CALCULATED USING THE PROBIT METHOD

ITERATIONS	G	H
9	6.910711	26.01412

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 = 6.052215
 95 PERCENT CONFIDENCE LIMITS = -9.857986 AND 21.96242

LC50 = .2439825
 95 PERCENT CONFIDENCE LIMITS = 0 AND +INFINITY

LC10 = .1504937