9-12-86

DATA EVALUATION RECORD

1. Chemical: PP 321

2. Test Material: EC, 12.92% ai

3. Study/Action Type: Fish 96-hr Acute Toxicity Test - Continous Flowthrough Rainbow Trout

4. Study ID: PP 321: Determination of acute toxicity of a 1 lb/US gallon EC formulation to rainbow trout (Salmo gairdneri) by R.W. Hill, ICI, March 1985. 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 but does not meet EPA Guidelines requirement since it was conducted with a formulated product. The study indicates that with an LC_{50} value of 3.4 (3.0-4.0) ug/L an EC formulation of PP 321, 12.92% ai is very highly toxic to coldwater fish.

8. Recommendations:

If formulated product testing is required with this product, this study will be Core for that requirement.

9. Background:

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

10. Materials and Methods:

a. Test Animals: Rainbow trout (Salmo gaidneri) obtained from the Zeals Fish Farm, Zeals, Wiltshire:

Weight = 2.76 g, range of 1.28 to 4.78 g.
Length = 57.2 mm, range of 44 to 70 mm.

b. Dosage: PP 321 EC formulation (GFU383C), 1 lb/gal, 12.92% ai. Stock concentrations made with deionized water. Dilution water - hardness of 79.2, alkalinity of 25.2 and conductivity of 196. Continous flowthrough system with a renewal rate of 200 mL/min and 95% exchange of the 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, 0.19, 0.29, 0.50, 1.13, 2.10, 4.03 and 7.75 ug PP 321/L. There were 20 fish per concentration. The fish were acclimatized in the test vessels for at least 3 days at the test temperature of 12 °C prior to the initiation of the test.

d. Statistical Analysis: The data were analyzed with Finneys' probit analysis.

11. Reported Results:

Nominal conc. (ug/L)	Measured Conc. (ug/L)	% Mortality 24h	48h	72h	96h
10	7.75	40	95	100	100
5.6	4.03	0	25	45	75
3.2	2.15	0	0	0	0
1.8	1.13	0	0	0	0
1.0	0.50	0	0	0	0
0.56	0.29	0	0	0	0
0.32	0.19	0	0	0	0
Control	-	0	0	0	0

Time	LC_{50} (ug/L)	95% ci (Based on measured concentrations)
24 h	> 7.8	(4.1-5.7)
48 h	4.9	(3.5-4.8)
72 h	4.1	(3.0-4.0)
96 h	3.4	

The general symptoms of toxicity displayed by intoxicated fish were loss of equilibrium, weakness, spiraling, surfacing, coughing, darkening in color, rapid respiration and quiescence. These symptoms generally occurred more frequently in fish exposed to 2.10 ug/L and greater.

DO levels ranged from 96 to 10.4 mg/L and pH ranged from 7.5 to 7.8 in the fish exposure vessels.

12. Study Author's Conclusions/QA Measures:

The 96-hr LC_{50} value for PP 321 EC, 12.92% ai is 3.4 (3.0-4.0) ug/L to rainbow trout.

"The conduct of this study has been inspected/audited in accordance with ICI's Policies and Procedures for Good Laboratory Practices."

13. Reviewer's Evaluation:

a. Test Methods: The protocol used in this study basically follows Methods for Acute Toxicity Test With Fish, Macroinvertebrates and Amphibians, EPA-660/3-75-009, April 1975. Instead of the technical grade, a formulated product was the test material.

b. Statistical Analysis: The data were analyzed with EEB's "Aquatox Program." The 96-hr LC_{50} value was computed to be 3.38 (2.1-4.03) ug/L by the binomial method.

c. Discussion/Results: The data indicate that an EC formulation of PP 321, 12.92% ai is very highly toxic to coldwater fish.

d. Conclusions:

1. Category: Supplemental.

2. Rationale: The study is scientifically sound but does not meet EPA Guidelines requirement for an acute toxicity test with a coldwater fish.

3. Reparability: If formulated product testing is required with this product, this study will be Core for that requirement.

STAVOLA PP321 EC RAINBOW TROUT ACUTE 96 HR

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CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB.(PERCENT)
7.75	20	20	100	9.536742E-05
4.03	20	15	75	2.069473
2.1	20	0	0	9.536742E-05
1.13	20	0	0	9.536742E-05
.5	20	0	0	9.536742E-05
.29	20	0	0	9.536742E-05
.19	20	0	0	9.536742E-05

THE BINOMIAL TEST SHOWS THAT 2.1 AND 4.03 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 3.381827

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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