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11-30-90 ~~2-24-81~~

Duplicate

1. CHEMICAL: Cypermethrin

2. FORMULATION: Technical

3. CITATION: ICI (1980) Determination of the acute toxicity of cypermethrin (pp 383) to Bluegill Sunfish (Lepomis macrochirus) MRID 00065812

4. REVIEWED BY: Thomas B. Johnston
Biologist, EEB

5. DATE REVIEWED: February 24, 1981

6. TEST TYPE: Continuous flow 96-hr LC_{50}

7. REPORTED RESULTS: The 96-hr LC_{50} of cypermethrin technical to bluegill sunfish, as calculated from measured concentrations, was 1.78 ppb, with 95% confidence limits of 1.63 and 1.95 ppb.

8. REVIEWER'S CONCLUSIONS: This study is scientifically sound, and satisfies the guideline requirement of a toxicity test using a warmwater fish. With a 96-hr LC_{50} of 1.78 ppb, cypermethrin technical is very highly toxic to ~~cold~~WARM-water fish.

ADDENDUM

REVIEWED BY: Ann Stavola
Aquatic Biologist
EEB/EFED
Ann Stavola 11/30/90

2. FORMULATION: Technical, 91.5% active ingredient

7. REPORTED RESULTS: No effect level was 0.71 ppb.

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Materials/Methods

Test Procedures - Test fish were exposed to the pesticide by use of a continuous flow-through apparatus. Test material from a stock jar was mixed with dilution water from a constant-temperature apparatus, and both were pumped into 20 litre exposure vessels. Each vessel contained 20 fish. Mortalities were recorded at 24-hr intervals for 96 hours. DMSO was used as a solvent. Each vessel was fed with the appropriate test concentration at the rate of 200 ml/min. The system was designed to achieve a complete exchange of the test solutions within a period of 3.5 hours.

Statistical Analysis - The mortality data were analyzed by the Finney probit analysis method.

Results/Discussion

	95% Confidence Intervals
24 hr LC_{50} = 3.07 ppb	2.77 - 3.39
48 hr LC_{50} = 2.15	1.99 - 2.33
72 hr LC_{50} = 1.85	1.70 - 2.02
96 hr LC_{50} = 1.78	1.63 - 1.95

All these listed LC_{50} values were calculated using mean measured concentrations of the test substance, not nominal concentrations.

Conclusions:

Validation Category: Core
Category Rationale: N/A
Category Repairability: N/A

CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB.(PERCENT)
3.17	20	20	100	9.536743E-05
2.38	20	20	100	9.536743E-05
1.93	20	12	60	25.17223
1.44	20	2	10	0.02012253
0.71	20	0	0	9.536743E-05
0.35	20	0	0	9.536743E-05

THE BINOMIAL TEST SHOWS THAT 1.44 AND 2.38 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 1.830469

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RESULTS CALCULATED USING THE MOVING AVERAGE METHOD

SPAN	G	LC50	95 PERCENT CONFIDENCE LIMITS	
4	0.04728639	1.614796	1.467894	1.788587

RESULTS CALCULATED USING THE PROBIT METHOD

ITERATIONS	G	H	GOODNESS OF FIT PROBABILITY
9	0.1485385	1	0.8305788

SLOPE = 15.09127
95 PERCENT CONFIDENCE LIMITS = 9.274991 AND 20.90756

LC50 = 1.79724
95 PERCENT CONFIDENCE LIMITS = 1.6649 AND 1.922496

LC10 = 1.480647
95 PERCENT CONFIDENCE LIMITS = 1.260973 AND 1.610189