1. CHEMICAL: Cypermethrin

2. FORMULATION: GFU 061 (36% w/v)

3. CITATION: Determination of the acute toxicity of GFU 061, a 36% w/v formulation of cypermethrin to Bluegill Sunfish (Lepomis macrochirus)

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 formulation GFU 061 to bluegill sunfish, as calculated from measured concentrations, was 5.69 ppb, with 95% confidence limits of 4.92 and 6.59 ppb.

8. REVIEWER'S CONCLUSIONS: This study is scientifically sound, but does not satisfy the guideline requirement of a toxicity test of a warmwater fish because it was not run on technical cypermethrin. With a 96-hr LC_{50} of 5.69 ppb, cypermethrin formulation GFU 061 is very highly toxic to warmwater fish.

Should be care for formulated product test requirements if needed.   BJ.

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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} = 27.19 ppb	16.49 – 487 ppb
48 hr LC_{50} = 7.65	5.24 – 10.30
72 hr LC_{50} = 6.19	4.64 – 7.92
96 hr LC_{50} = 5.69	4.92 – 6.59

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

Conclusions:

Validation Category: Supplemental
Category Rationale: The test was run on a formulated product, rather than on the technical.
Category Repairability: Not repairable

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CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB. (PERCENT)
15.5	20	20	100	9.536743E-05
12.2	20	19	95	0.002002716
10.4	20	18	90	0.02012253
5.87	20	7	35	13.1588
4.24	20	2	10	0.02012253
2.64	20	3	15	0.1288414
1.94	20	2	10	0.02012253
1.13	20	0	0	9.536743E-05

THE BINOMIAL TEST SHOWS THAT 4.24 AND 10.4 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 6.773055

RESULTS CALCULATED USING THE MOVING AVERAGE METHOD
SPAN	G	LC50	95 PERCENT CONFIDENCE LIMITS	
6	0.04118875	5.54222	4.695559	6.721523

RESULTS CALCULATED USING THE PROBIT METHOD
ITERATIONS	G	H	GOODNESS OF FIT PROBABILITY
6.	0.2086773	2.151525	0.04450157

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

SLOPE   =   4.107525
95 PERCENT CONFIDENCE LIMITS = 2.231158   AND   5.983893

LC50 =   5.787203
95 PERCENT CONFIDENCE LIMITS = 4.190952 AND 7.849006

LC10 =   2.83975
95 PERCENT CONFIDENCE LIMITS = 1.369607 AND 3.97268

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