1-8-91
Duplicated

DATA EVALUATION

1. CHEMICAL: Cypermethrin

2. FORMULATION: 91.5 % active ingredient (Technical Grade)

3. CITATION: Hetimuller, T. (1980) Acute toxicity of Cypermethrin to sheepshead minnows (Cyprinodon variegatus) EG&G Bionomics Report. Number BP-80-9-154-R submitted to EPA by ICI Americas, Inc. 12/28/81.

EPA Accession No. 070561 MRID 00090075

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

5. REVIEW DATE: March 31, 1982

6. TEST TYPE: 96-hr flow-through acute toxicity test.

7. REPORTED RESULTS: The reported 96-hr flow-through LC_{50} of Cypermethrin for sheepshead minnows is 0.95 ppb, with 95% confidence limits of 0.48 and 1.9 ppb. (See amendment below)

8. REVIEWER'S CONCLUSIONS: This study is scientifically sound, and fulfills USEPA guideline requirements for an acute toxicity test using an estuarine vertebrate. With a 96-hr LC_{50} of 0.95 ppb, cypermethrin technical is very highly toxic to sheepshead minnows. (See amendment below)

AMENDED REVIEW

Reviewed by: Ann Stavola
Aquatic Biologist
EEB/EFED
Ann Stavola 1/8/91

Conclusions: The study is scientifically sound and fulfills EPa guideline requirements for an acute toxicity study with an estuarine fish. With an LC50 value of 0.73 (0.48 to 1.9 PPB CI) ppb, technical cypermethrin is very highly toxic to sheepsnead minnows. The LC50 value was adjusted to reflect the value calculated by EEB's Toxanal program (see attached sheet.

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Materials/Methods

Methods used generally followed USEPA guidelines. The flow through apparatus utilized filtered natural seawater at a salinity of 27 ppt. Temperature was maintained at 26°C, rather than the 22°C recommended by the ASTM guide. The LC_{50} was calculated using measured, rather than nominal, concentrations.

Statistical Analyses

Data were analyzed according to the methods of Stephan, USEPA laboratory in Duluth. Values were calculated by binominal probability.

Results

Concentrations (ppb)	No. Dead/No. Exposed
1.9	20/20
.64	8/20
.48	0/20
.24	0/20
.11	0/20

96-hr LC_{50} = 0.95

Note: EEB analysis calculates an LC_{50} of 0.73 ppb for this set of data. (See attached sheets.)

Conclusions:

Validation Category: Core

Category Rationale: N/A

Category Repairability: N/A

stavola cypermethrin fish acute

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CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB.(PERCENT)
5	20	20	100	9.536742E-05
2.5	20	8	40	25.17223
1.2	20	0	0	9.536742E-05
.6	20	0	0	9.536742E-05
.3	20	0	0	9.536742E-05

THE BINOMIAL TEST SHOWS THAT 1.2 AND 5 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 2.725094

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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stavola cypermethrin SHEEPSHEAD MINNOW ACUTE

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CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB.(PERCENT)
1.9	20	20	100	9.536742E-05
.64	20	8	40	25.17223
.48	20	0	0	9.536742E-05
.24	20	0	0	9.536742E-05
.11	20	0	0	9.536742E-05

THE BINOMIAL TEST SHOWS THAT .48 AND 1.9 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 .7327532

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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