1.  **CHEMICAL**: Cypermethrin

2.  **FORMULATION**: Technical

3.  **CITATION**: ICI (1980) Determination of the acute toxicity of cypermethrin (pp383) to Rainbow Trout (Salmo gairdneri).  MRID 00062792

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 rainbow trout, as calculated from measured concentrations, was 0.92 ppb, with 95% confidence limits of 0.81 and 1.05 ppb.

8.  **REVIEWER'S CONCLUSIONS**: This study is scientifically sound, and satisfies the guideline requirement of a toxicity test using a coldwater fish.  With a 96-hr $LC_{50}$ of 0.92 ppb, cypermethrin technical is very highly toxic to coldwater fish.

ADDENDUM

REVIEWED BY:  Ann Stavola
             Aquatic Biologist
             EEB/EFED

11/30/90

2.  **FORMULATION**:  Technical, 91.5% active ingredient

7.  **REPORTED RESULTS**:  No effect level was 0.43 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 $LC_{50}$ = 1.78 ppb | | 1.50 - 2.12 |
| 48 hr $LC_{50}$ = 1.00 | | 0.97 - 1.25 |
| 72 hr $LC_{50}$ = 0.96 | | 0.84 - 1.09 |
| 96 hr $LC_{50}$ = 0.92 | | 0.81 - 105 |

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

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       CONC.          NUMBER         NUMBER         PERCENT        BINOMIAL
                      EXPOSED        DEAD           DEAD           PROB.(PERCENT)
                                                                  - .536743E-05
      0.00335          20             20             100          - .536743E-05
      0.00195          20             20             100           0.002002716
      0.00149          20             19             - 5           25.17223
      0.00108          20             12             60            0.02012253
      0.00055          20             2              10           - .536743E-05
      0.00043          20             0              0            - .536743E-05
      0.00025          20             0              0            - .536743E-05
      0.00014          20             0              0
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THE BINOMIAL TEST SHOWS THAT 0.00055 AND 0.00149 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 0.0009559664


RESULTS CALCULATED USING THE MOVING AVERAGE METHOD
   SPAN          G               LC50          - 5 PERCENT CONFIDENCE LIMITS
   6          0.04808197    0.0008325176   0.0007260318   0.0009565194


RESULTS CALCULATED USING THE PROBIT METHOD
   ITERATIONS      G               H          GOODNESS OF FIT PROBABILITY
   -            0.09172139        1              0.- 307529


SLOPE     =        6.- 8012
- 5 PERCENT CONFIDENCE LIMITS  = 4.866153        AND    - .094087


LC50 =            0.0009223139
- 5 PERCENT CONFIDENCE LIMITS = 0.000797391 AND  0.001049235


LC10 =            0.0006066434
- 5 PERCENT CONFIDENCE LIMITS = 0.0004653702 AND  0.0007146739
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