

US EPA ARCHIVE DOCUMENT

081901

3-7-80 not

DATA EVALUATION SHEET

1. CHEMICAL: Bravo 500

2. FORMULATION: Chlorothalonil

3. CITATION

Buccafusco, Robert, 1979. Chlorothalonil Acute Toxicity Study in Rainbow Trout. An Unpublished Report prepared by EG & G, Bionomics for Diamond Shamrock Corporation. (Accession Number 099247)

4. REVIEWED BY: Daniel Rieder
Wildlife Biologist
EEB/HED

5. DATE REVIEWED: March 7, 1980

6. TEST TYPE: 96-hour Acute Toxicity

A. Test Species: Rainbow trout (Salmo gairdneri)

B. Test Material: Chlorothalonil (Technical, 96%)

7. REPORTED RESULTS

The reported 96-hour LC_{50} is 47 ppb with 95% confidence limits of 32 - 68 ppb. The highest concentration in which no mortalities occurred was 32 ppb. All 10 fish died in the 68 ppb concentration.

8. REVIEWERS CONCLUSION

A. Validation Category: Supplemental

B. Discussion

The study was conducted scientifically and indicates that chlorothalonil could be very highly toxic to rainbow trout. However, it does not fulfill the requirements for an acute toxicity test for fish.

METHODS/RESULTS

A. Test Procedures

Test protocol followed those described in "Methods for acute toxicity tests with fish, macroinvertebrates, and amphibians" (U.S. EPA, 1975). Ten fish were used in each of the 7 test containers and in the solvent control and control. The concentrations were nominally; 8.8, 15, 22, 32, 46, 68, and 100 ppm active ingredient. Active Ingredient purity was 96%. Dissolved Oxygen content was measured in the controls and at the high (100 ppm), medium (32 ppm) and low (5.8) concentration.

B. Statistical Analysis

The 96-hour LC_{50} and its 95% confidence limits was calculated by the binomial probability method.

C. Results

The 96-hour LC_{50} for rainbow trout exposed to chlorothalonil is estimated at 47⁵⁰ ppb with 95% confidence limits of 32-68 ppb. No mortalities occurred in the controls or the test concentrations up to the 32 ppb level, and 100% mortality occurred in the 68 ppb concentration level. Partial mortality occurred at only one concentration level.

REVIEWER'S EVALUATION

A. Test Procedure

The main deviation from the accepted guidelines is that the DO was only measured in the high, medium, and low test concentrations. The DO content fell to 10% saturation with 100 ppb concentration test container. Since the DO was not measured in the test concentration at which the partial kill occurred, there is no way to tell whether a low DO was responsible for the deaths.

B. Statistical Analysis

The raw data provided with the report was used with Stephens statistical analysis computer program; the results indicate that an approximate LC_{50} is 42.3 ppb. Since there were less than two concentrations at which the percent dead was between 0 and 100, neither the moving average nor the probit method can give statistically sound results.

C. Discussion

The results would indicate that chlorothalonil is very highly toxic to rainbow trout. However, the low DO reported in the highest concentration, and the lack of information on DO in the concentrations where between 0% and 100% mortality occurred, would cast some doubt on the validity of these results.

D. Conclusions

1. Category: Supplemental

2. Rationale

This study cannot be considered core because the low DO content in the highest test concentration. Additionally, no DO measurements were taken in the other test containers where 100% or partial kills occurred. Food was withheld from the fish for only 48 hours prior to testing.

3. Repairability: N/A

CHLOROTHALONIL
 RAINBOW TROUT
 Daniel Rieder
 3/7/80

CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB. (PERCENT)
100	10	10	100	9.76563E-2
68	10	10	100	9.76563E-2
46	10	7	70.	17.1875
32	10	0	0	9.76563E-2
22	10	0	0	9.76563E-2

THE BINOMIAL TEST SHOWS THAT 32 AND 68 CAN BE USED AS STATISTICALLY SOUND CONSERVATIVE 95 PERCENT CONFIDENCE LIMITS SINCE THE ACTUAL CONFIDENCE LEVEL ASSOCIATED WITH THESE LIMITS IS GREATER THAN 95 PERCENT.

AN APPROXIMATE LC50 FOR THIS SET OF DATA IS 42.3428

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.
