

US EPA ARCHIVE DOCUMENT

081901

no study for RLs.

bluegill

DATA EVALUATION SHEET

1. CHEMICAL: DS-3701
2. FORMULATION: Primary metabolite of chlorothalonil 4-hydroxy-2,5,6-trichloroisophthalonitrile.
3. CITATION

Buccafusco, Robert J., 1977. Acute Toxicity of DS-3701 to Bluegill (Lepomis macrochirus). Received February 25, 1980. Unpublished report prepared by EG & G Bionomics for Diamond Shamrock Corporation.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: April 7, 1980
6. TEST TYPE: Acute Toxicity
 - A. Test Species: Bluegill
 - B. Test Material: DS-3701 (99% pure)
7. REPORTED RESULTS

The 96-hour LC_{50} and 95% confidence limits for bluegill exposed to DS-3701 is 16 mg/l (13-20 mg/l).
8. REVIEWERS CONCLUSION
 - A. Validation Category: Supplemental
 - B. Discussion

This study was scientifically conducted and indicates that DS-3701 is slightly toxic to bluegill. It does not fulfill the requirements for an acute toxicity test for bluegill because of the low dissolved oxygen content in the test containers.

METHODS/RESULTS

A. Test Procedure

The procedure which the laboratory followed was cited as the "Methods for Acute Toxicity Tests with Fish, Macroinvertebrates, and Amphibians" (U.S. EPA, 1975). All test solutions were maintained at 22 ± 1 °C and were not aerated. A solvent control (acetone) was also used. The dissolved oxygen was measured at 0, 24, 48, and 96 hours in the control, solvent control and the high, middle and low test concentrations. Nominal concentrations tested were; 6.0, 10, 17, 28, 46, 78, 130 and 220 mg/l.

B. Statistical Analysis

The moving average angle was used to calculate the 96-hour LC_{50} .

C. Results

The reported 96-hour LC_{50} and 95% confidence intervals for bluegill exposed to DS-3701 (a metabolite of Chlorothalonil) is 16 mg/l (13 - 20 mg/l). No mortality occurred in the 10 mg/l concentration, all fish died in the 28 mg/l concentration. The 17 mg/l test level was the only one in which > 0% and < 100% mortality occurred. The no discernable effect concentration was less than 6.0 mg/l since some fish displayed a partial loss of equilibrium at that level. The dissolved oxygen (DO) was below 60% saturation at 48 hours in the 6.0 mg/l container and the solvent control. Furthermore, the DO was below 40% saturation at 96 hours with 6.0 mg/l and the solvent control.

REVIEWERS EVALUATION

A. Test Procedures

The reported protocol is generally acceptable, however the dissolved oxygen content should have been measured in all test containers at the end of 48 and 96 hours.

B. Statistical Analysis

The raw data were analyzed with Stephens computer program. Since there were less than 2 concentrations at which the percent dead was between 0 and 100, neither the moving average nor the probit method could give statistically sound results. A printout of the statistical results are attached to the original review.

C. Discussion

The 96-hour LC_{50} of DS-3701 as it affects the bluegill is probably between 10 and ⁵⁰28 mg/l. The binomial test estimates the 96-hour LC_{50} to be 15.0 mg/l. This LC_{50} is similar to the one reported in the study. Since the DO was not measured in the container where a partial kill occurred, it is assumed it was as low or lower than in which it was measured at 96 hours.

D. Conclusions

1. Category: Supplemental

2. Rationale

The low dissolved oxygen is unacceptable in the concentrations where partial kills occurred since it could have been the cause of death, rather than the pesticide.

3. Repairability: N/A

Daniel Rieder
~~Bravo-500~~ DS3701
96-hour LC50 bluegill

April 8, 1980

80/04/08. 13.45.43:
BASIC PROGRAM LC50

CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB.(PERCENT)
46	10	10	100	9.76563E-2
28	10	10	100	9.76563E-2
17	10	7	70.	17.1875
10	10	0	0	9.76563E-2
6	10	0	0	9.76563E-2

THE BINOMIAL TEST SHOWS THAT 10 AND 28 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 15.0606

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.
