CASE GS0097 CHLOROTHALONIL PM 400 08/03/82

CHEM 081901 Chlorothalonil (tetrachloroisophthalon

BRANCH EEB DISC 40 TOPIC 05103043

FORMULATION 01 - TECHNICAL CHEMICAL

FICHE/MASTER ID 00030393 CONTENT CAT 01

Buccafusco, R,J, (1977) Acute Toxicity of DTX-77-0070 (DS-3701) to Bluegill (‡"Lepomis macrochirus"‡), (Unpublished study including submitter summary, received Feb 19, 1980 under 677-313; prepared by EG&G, Bionomics, submitted by Diamond Shamrock Agricultural Chemicals, Cleveland, Ohio; CDL:099247-L)

SUBST, CLASS = S,

DIRECT RVW TIME = (MH) START-DATE END DATE

REVIEWED BY: Daniel Rieder
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SIGNATURE: Daniel Rieder DATE: 12/16/82

APPROVED BY:
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DATA EVALUATION SHEET

1. CHEMICAL: DS-3701

2. FORMATION: 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 Unpublished report prepared by EG & G Bionomics for Diamond Shamrock Corporation.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
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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: Core.

B. Discussion

This study was scientifically conducted and indicates that DS-3701 is slightly toxic to bluegill. It ~~does not~~ fulfills the requirements for an acute toxicity test for bluegill because the low dissolved oxygen content in the test containers was not a problem because the fish survived at the 6 ppb level where the DO was the lowest.

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~~ degradate 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.

Concentration (ppb)	Number tested	96 hour Mortality (%)	DO (%)
Control	10	0	60
acetone control	10	0	17
6	10	0	8
10	10	0	-
17	10	~~20~~ 70	-
28	10	~~60~~ 100	-
46	10	~~90~~ 100	74%*
78	10	~~70~~ 100	-
130	10	100	-
220	10	100	98%**

* 48 hour DO all fish dead after that
** 0 hour DO all fish dead after that

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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 Stephans 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 28 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. The fish survived at 6 ppb where the DO was lowest and died at the higher levels before the DO dropped to low levels. The low DO is not considered a problem.

D. Conclusions

1. Category: Core.