2-25-85

DATA EVALUATION RECORD

1. CHEMICAL: HOE 033171

2. TEST MATERIAL: EC Formulation (% a.i. unknown)
(HOE 033171 OH EC13 A111)

3. STUDY TYPE: Aquatic invertebrate $LC_{50}$
Species tested: Crayfish (Procambarus simulans)

4. CITATION: McAllister, W.A. and P. Cohle. 1984. Acute Toxicity of HOE 033171 OH EC13 A111 to Juvenile Crayfish (Procambarus simulans, Faxon). Prepared by Analytical Bio-Chemistry Laboratories, Inc., Columbia, MO.; Submitted by American Hoechst Corp., NJ; Report #31750; Acc. No. 255859.

5. REVIEWED BY:

Carol M. Natella
Wildlife Biologist
Ecological Effects Branch/HED

Signature: Carol M. Natella
Date: 2-25-85

6. APPROVED BY:

Harry Craven
Supervisory Biologist
EEB/HED

Signature: H. T. Craven
Date: 2-25-85

7. CONCLUSIONS:

The study is scientifically sound and with a 96-hour $LC_{50}$ of 3.1 ppm, this EC formulation of HOE 033171 is moderately toxic to crayfish.

However, this study is unacceptable as it stands because the percent active ingredient of the test material is not provided. Upon receipt of this information, however, this study will not fulfill any requirement for an aquatic invertebrate bioassay performed with the formulated product because the crayfish is not a recommended species.

8. RECOMMENDATIONS:

An identification of the formulated product used and the percent active ingredient is needed.

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9. BACKGROUND: N/A

10. DISCUSSION OF INDIVIDUAL TEST: N/A

11. MATERIALS AND METHODS:

A. Test animals: Juvenile crayfish (Procambarus simulans) were obtained from Northrup Fish Hatchery in Centralia, Missouri. Crayfish were observed for at least seven days prior to testing. During this period, the crayfish received a standard commercial fish food until testing at which time feeding was discontinued. The crayfish had a mean weight of 0.32 (± 0.094)g and a length of 24 (± 2.7)mm.

B. Test system: Five-gallon glass vessels containing 15 liters of ABC well water with a pH of 8.0, hardness (as $CaCO_3$) of 225-275 ppm, alkalinity (as $CaCO_3$) of 325-275 ppm, and conductivity of 700 umhos/cm. Test vessels were maintained at 22°C (± 1.0).

C. Dosing: Static bioassay. Crayfish were added to the test chambers within 30 minutes after addition of test material. The solvent control received an aliquot (5 ml) of acetone equivalent to that used in the highest test concentration.

D. Study design: Ten crayfish per concentration; five concentrations, a water control and a solvent control (1.0, 1.8, 3.2, 5.6 and 10 ppm. Nominal concentrations).

E. Statistics: The computer program by Stephan et al. was employed to obtain $LC_{50}$ values. The methods of calculation that gave the narrowest confidence limits were selected for presentation in this report.

12. REPORTED RESULTS:

24-hour $LC_{50}$ = 11 ppm (95% C.L. 8.2 - 500)[1].
48-hour $LC_{50}$ = 8 ppm (95% C.L. 6.3 - 12)[1].
96-hour $LC_{50}$ = 3.1 ppm (95% C.L. 2.2 - 4.3)[2].

1. Probit method
2. Moving average method

No behavioral changes were observed in any of the test or control crayfish during the study. The lack of a distinct linear dose-response curve as the study progressed may have been due to a random ecdysis of some of the crayfish in the test chambers (crayfish in ecdysis are more susceptible to stress than at other stages). The no-effect concentration based on the lack of mortality and abnormal effects after 96-hours of exposure was 1.0 ppm.

Percent Mortality

| Conc., ppm | 10 | 5.6 | 3.2 | 1.8 | 1.0 | Control | Solvent Control |
|---|---|---|---|---|---|---|---|
| 24 hrs. | 40 | 10 | 0 | 0 | 0 | 0 | 0 |
| 48 hrs. | 70 | 20 | 0 | 0 | 0 | 0 | 0 |
| 96 hrs. | 90 | 30 | 20 | 100 | 0 | 10 | 0 |

13. STUDY AUTHOR'S CONCLUSIONS/QA MEASURES:

96-hour $LC_{50}$ = 3.1 ppm (95% C.L. 2.2 - 4.3)
(Calculated by the moving average method)

QA Measures: See attached

14. REVIEWER'S DISCUSSION AND INTERPRETATION OF THE STUDY:

A. Test Procedures: The procedures for this aquatic invertebrate static bioassay are as described in Methods for Acute Toxicity Tests With Fish, Macroinvertebrates and Amphibians. The only departure is in the fact that the crayfish were not fasted for the 24-hour period prior to testing. The rationale given for this departure was due to the cannibalistic nature of the crayfish (letter to American Hoechst Corporation from W. A. McAllister, ABC Labs, July 17, 1984). It should also be noted that testing took place in very hard water.

The report from the Analytical Laboratory (Hoechst AG) states that the test material is an EC formulation but does not give the percent active ingredient.

B. Statistical Analysis: The author utilized Stephan's computer program to obtain the $LC_{50}$ values. The 96-hour $LC_{50}$ was calculated using the moving average method. No additional work on the statistical analysis is necessary.

C. Discussion/Results: With a 96-hour $LC_{50}$ value of 3.1 ppm (2.2 - 4.3), this formulation of HOE 033171 is moderately toxic to crayfish.

D. Adequacy of Study:

1. Classification: Invalid

2. Rationale: The percent active ingredient of the test material is not provided.

3. Repairability: Supplemental (for this formulated product), upon receipt of information on the percent active ingredient.

15. COMPLETION OF ONE-LINER: Yes, February 5, 1985.

16. CBI APPENDIX: N/A

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Quality Assurance Statement for final report #31750 entitled, "Acute Toxicity of HOE 033171 OH EC13 A111 to Juvenile Crayfish (Procambarus simulans, Faxon)," for Mr. Victor A. Dorr, American Hoechst Corporation, Somerville, New Jersey.

In accordance with ABC Laboratories intent that all studies conducted at our facilities are designed and function in conformance with good laboratory practice regulations and the protocols for individual laboratory studies, an inspection of the final report for HOE 033171 OH EC13 A111 was conducted and found to be in an acceptable form by a member of our Quality Assurance Unit. An inspection of the daily mortality rate of the test organisms prior to the initiation of the study indicated they were in good health and should not bias the observed mortality in the study. A final inspection of all data and records on July 11, 1984 indicated that the report submitted to you is an accurate reflection of the study as it was conducted by ABC Laboratories.

Should you have any questions relating to the information provided in this statement or the function of our Quality Assurance Unit, please contact the Quality Assurance Unit at your convenience.

Phillip M. Buckler 7/19/84
Phillip M. Buckler Date
Quality Assurance Officer

Study Compliance Statement for ABC report #31750 entitled, "Acute Toxicity of HOE 033171 OH EC13 A111 to Juvenile Crayfish (Procambarus simulans, Faxon)," for Mr. Victor A. Dorr, American Hoechst Corporation, Somerville, New Jersey.

In accordance with ABC Laboratories' intent that all aquatic toxicity tests conducted by our facility follow good laboratory practices, ABC's study director for the above test herein confirms that the study was conducted in compliance with the U.S. E.P.A. Good Laboratory Practice Standards; Pesticide Programs (40 CFR 160).

All original raw data was sent to American Hoechst Corporation, with a copy retained at Analytical Bio-Chemistry Laboratories.

7-19-84
William A. McAllister Date
ABC Study Director

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# $LC_{50}$ COMPUTER ANALYSIS DATA SHEET

Test Material: HOE-033171 (OH ECJ3A111)
Study No.: 31750
Test Species: Procambarus simulans
Exposure Period: 96 hour
ABC Study Director: W.A. McAllister

Lab Form No.: 42

Analytical Bio-Chemistry Labs
Aquatic Toxicology Division
7200 ABC Lane, P.O. Box 1097
Columbia, Missouri 65205

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| CONC. PPM | NUMBER EXPOSED | NUMBER DEAD | PERCENT DEAD | BINOMIAL PROB.(PERCENT) |
|---|---|---|---|---|
| 10 | 10 | 9 | 90 | 1.07422 |
| 5.6 | 10 | 3 | 30 | 17.1875 |
| 3.2 | 10 | 2 | 20 | 5.46875 |
| 1.8 | 10 | 10 | 100 | .0976563 |
| 1 | 10 | 0 | 0 | .0976563 |

THE BINOMIAL TEST SHOWS THAT 1 AND 10 CAN BE USED AS

STATISTICALLY SOUND CONSERVATIVE 95 PERCENT CONFIDENCE LIMITS BECAUSE THE ACTUAL CONFIDENCE LEVEL ASSOCIATED WITH THIS LIMIT IS 98.9 PERCENT

AN APPROXIMATE LC50 OF 4.03144 PPM IS OBTAINED BY

NONLINEAR INTERPOLATION BETWEEN 1 AND 10

----RESULTS CALCULATED USING THE MOVING AVERAGE METHOD----

| SPAN | G | LC50 PPM | 95 PERCENT CONFIDENCE LIMITS LOWER | UPPER |
|---|---|---|---|---|
| 4 | .159826 | 3.10255 | 2.22789 | 4.27833 |
| 3 | .882986 | 2.5414 | .3490386 | 1.438485E+12 |
| 2 | .370771 | 6.23511 | 4.47736 | 8.78828 |
| 1 | .508504 | 6.71128 | 4.28468 | 8.36173 |

----------RESULTS CALCULATED USING THE PROBIT METHOD----------

| ITERATIONS | G | H | CHI-SQUARE | PROBABILITY |
|---|---|---|---|---|
| 4 | 19.9528 | 9.88188 | 25.5851 | <0.001 |

BECAUSE THE PROBABILITY IS LESS THAN 0.05, RESULTS CALCULATED USING THE PROBIT METHOD PROBABLY SHOULD NOT BE USED.

SLOPE = 1.21052
95 PERCENT CONFIDENCE LIMITS =-4.11614 AND 6.53719

LC50 = 3.5207

95 PERCENT CONFIDENCE LIMITS = 0 AND +INFINITY

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Method Reported:

☐ Binomial ☒ Moving Average ☐ Probit

Note: Method selected is that which gives the narrowest confidence limits for $LC_{50}$.

Prepared By: Paul Cobb Date: 6/19/84
Checked By: William A. McAllister Date: 7-5-84