2-25-85

DATA EVALUATION RECORD

1. CHEMICAL: HOE 033171

2. TEST MATERIAL: 96.5% technical
(HOE 033171 OH ZD96 0001)

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 ZD96 0001 to Juvenile Crayfish (Procambarus simulans, Faxon). Prepared by Analytical Bio-Chemistry Laboratories, Inc., Columbia, MO.; Submitted by American Hoechst Corp., NJ; Report #31749; 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 1.1 ppm (0.74-1.5), HOE 033171 is moderately toxic to crayfish.

The study does not fulfill the requirement for an aquatic invertebrate bioassay because the crayfish is not a recommended species.

8. RECOMMENDATIONS: N/A

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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 0.35 (± 0.079)g and a length of 24 (± 2.8)mm.

B. Test system: Five-gallon glass vessels containing 15 liters of ABC well water with a pH of 8.1, 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 (5.6 ml) of acetone equivalent to that used in the highest test concentration.

D. Study design: Ten crayfish per concentration; six concentrations, a water control and a solvent control (0.32, 0.56, 1.0, 1.8, 3.2 and 5.6 ppm. Nominal concentrations).

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

12. REPORTED RESULTS:

24-hour LC_{50} = 4.5 ppm (95% C.L. 3.0 - 12)
48-hour LC_{50} = 1.9 ppm (95% C.L. 1.3 - 2.9)
96-hour LC_{50} = 1.1 ppm (95% C.L. 0.74 - 1.5)

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).

Percent Mortality

Conc., ppm	5.6	3.2	1.8	1.0	0.56	0.32	Control	Solvent Control
24 hrs.	50	40	30	0	0	0	0	0
48 hrs.	70	80	70	30	0	0	0	0
96 hrs.	100	80	90	50	10	10	10	0

13. STUDY AUTHOR'S CONCLUSIONS/QA MEASURES:

96-hour LC_{50} = 1.1 ppm (95% C.L. 0.74 - 1.5)
(Calculated by probit analysis)

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.

B. Statistical Analysis: The author utilized Stephan's computer program to obtain the LC_{50} values. The results given were calculated by probit analysis. The slope (for the 96-hour mortality data) is 1.08 (95% C.L. 0.738 and 1.50). No additional work on the statistical analysis is necessary.

C. Discussion/Results: With a 96-hour LC_{50} value of 1.1 ppm, HOE 033171 is moderately toxic to crayfish.

D. Adequacy of Study:

1. Classification: Supplemental

2. Rationale: The crayfish is not a recommended species.

3. Repairability: No

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

16. CBI APPENDIX: N/A

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11151

Quality Assurance Statement for final report #31749 entitled, "Acute Toxicity of HOE 033171 OH ZD96 0001 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 ZD96 0001 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 #31749 entitled, "Acute Toxicity of HOE 033171 OH ZD96 0001 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.

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

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LC50 COMPUTER ANALYSIS DATA SHEET

Test Material: HOE-033171 (OH2 D96001)
Study No.: 31749
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)
5.6	10	10	100	.0976563
3.2	10	8	80	5.46875
1.8	10	9	90	1.07422
1	10	5	50	62.3047
.56	10	1	10	1.07422
.32	10	1	10	1.07422

THE BINOMIAL TEST SHOWS THAT .56 AND 5.6 CAN BE USED AS STATISTICALLY SOUND CONSERVATIVE 95 PERCENT CONFIDENCE LIMITS BECAUSE THE ACTUAL CONFIDENCE LEVEL ASSOCIATED WITH THIS LIMIT IS >95 PERCENT
1 PPM CAN BE USED AS AN APPROXIMATE LC50 FOR THIS SET OF DATA.

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

SPAN	G	LC50 PPM	95 PERCENT CONFIDENCE LIMITS LOWER	UPPER
5	.1811	1.07501	.690381	1.52945
4	.34932	1.05749	.817824	1.31553
3	.299082	1.00400	.480981	1.49917
2	.258422	1.00199	.737095	1.38209
1	1.07789	1	0	1.35707
1	1.07789	1	.73994	+INFINITY

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

ITERATIONS	G	H	CHI-SQUARE	PROBABILITY
4	.171731	1	4.15695	.385182

SLOPE = 2.87576
95 PERCENT CONFIDENCE LIMITS = 1.68403 AND 4.06748

✓ LC50 = 1.05244

95 PERCENT CONFIDENCE LIMITS = .738239 AND 1.46742
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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 Cohle Date: 6/19/84
Checked By: William A. McAllister Date: 7-5-84