(7-12-90)

MRID No. 410635-52
and 410635-50

DATA EVALUATION RECORD

1. **CHEMICAL:** BAS 514 H Quinclorac.
Shaughnessy Number: Not available. 128974

2. **TEST MATERIAL:** BAS 514 H; Lot No. 150-732N; 96.5% Active Ingredient; a grey-colored powder.

3. **STUDY TYPE:** Mollusc 48-hour Embryo Larvae Study.
Species Tested: Quahog clam (Mercenania mercenaria).

4. **CITATION:** Surprenant, D.C. 1986. Acute Toxicity of BAS 514 H to the Quahog clam (Mercenania mercenaria). Prepared by Springborn Bionomics, Inc., Wareham, Massachusetts. Bionomics Report #BW-86-12-2204. Bionomics Study #986.0385.6102.514. Submitted by BASF Corporation Chemicals Division, Parsippany, New Jersey. MRID No. 410635-52 and 410635-50.

5. **REVIEWED BY:**

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Signature:

Date:

6. **APPROVED BY:**

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Staff Toxicologist
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Date:

Henry T. Craven, M.S.
Supervisor, EEB/HED
USEPA

Signature: Henry T. Craven

Date: 7/12/90

Daniel Rabb 7-12-90

7. **CONCLUSIONS:** This study appears scientifically sound and fulfills the Guideline requirements for a quahog embryo-larval test. The 48-hour EC50 of BAS 514 H to quahog clams (Mercenania mercenaria) was greater than 96.1 mg/L measured concentration. Therefore, BAS 514 H is classified as practically non-toxic to quahog clams. The NOEC was determined to be 96.1 mg/L measured concentration.

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5. **REVIEWED BY:**

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7. **CONCLUSIONS:** This study appears scientifically sound and fulfills the Guideline requirements for a quahog embryo-larval test. The 48-hour EC50 of BAS 514 H to quahog clams (Mercenania mercenaria) was greater than 100 mg/L nominal concentration. Therefore, BAS 514 H is classified as practically non-toxic to quahog clams. The NOEC was determined to be <100 mg/L nominal concentration.

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8. RECOMMENDATIONS: N/A

9. BACKGROUND:

10. DISCUSSION OF INDIVIDUAL TESTS: N/A

11. MATERIALS AND METHODS:

A. Test Animals: Quahog embryos (Mercenania mercenaria) were obtained by induced spawning of sexually mature adult quahogs at a commercial shellfish hatchery. Adults were maintained in the hatchery in natural seawater with a typical salinity range of 28 - 32°/oo.

Individual, sexually mature quahogs were induced to spawn by placing them in containers of seawater which were placed in a heated water bath at 24°C. The water temperature in the containers was raised over a 5-minute period to approximately 30°C in the presence of viable sperm excised from the gonads of a sexually mature male quahog. Fertilization was achieved by adding a controlled amount of sperm to eggs released into the spawning chambers and was confirmed microscopically. Density of the embryos in the inoculum solution was determined by a Sedgwick-Rafter count using 1 mL of the embryo suspension from the spawning chamber. Adult quahogs were induced to spawn on the day of test initiation.

B. Test System: The toxicity test was conducted in 1-liter (L) glass beakers each containing 900 mL of test solution. All test solution temperatures were maintained at 21°C by a temperature-controlled environmental chamber. The dilution water was natural filtered seawater characterized as having a salinity of 32°/oo.

C. Dosage: Mollusc 48-hour embryo-larvae study.

D. Design: The test was initiated when approximately 23,200 embryos were inoculated into each triplicate BAS 514 H test solution of 100 mg/L and each of four control test solutions within 3.5 hours after fertilization.

After 48 hours of exposure, the larvae from each container were collected in a 37-um mesh size sieve, rinsed into a plastic bottle with 19 mL of filtered

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seawater, and preserved with 1 mL of neutralized formalin. The number of normally developed 48-hour old larvae was determined by a Sedgwick-Rafter count from each triplicate test and control solution.

The dissolved oxygen concentrations, pH's and temperatures of the test solutions were measured at 0 and 48 hours of the exposure period. Dissolved oxygen concentrations and pH were measured in the 3-L volume of the solution at test initiation and in the composited test solutions after the larvae were removed at test termination. Analytical determination of BAS 514 H was performed from each test vessel at 0, 24 and 48 hours of exposure. Water samples at 0 hour were removed from the 3-liter volume of test solution before it was distributed to the test vessels, from a reserved amount of this solution at 24 hours, and from the composited test solutions after the test organisms were removed at test termination.

E. Statistics: Results of the toxicity test were used to calculate the percentage reduction of normal clam larvae from the test concentration when compared to the control. The percentage reduction of normal 48-hour embryos was determined as follows:

$$\% \text{ Reduction} = \frac{\text{\# normal 48-hour control larvae minus \# normal 48-hour treated larvae}}{\text{\# normal 48-hour control larvae}} \times 100$$

These treatment percentage reductions were used to calculate the median effective concentration (EC50), defined as the concentration resulting in a 50% reduction in normal development of the larvae.

12. REPORTED RESULTS: The mean measured concentration of BAS 514 H was 96.1 mg/L. The mean measured concentration was 96% of the nominal concentration. The biological results from this corroborative test are summarized in Table 1 (attached). Exposure for 48 hours to a nominal test concentration of 100 mg/L BAS 514 H did not cause a 50% reduction of the number of normally developed quahog larvae. The mean number of normally developed larvae exposed to BAS 514 H was reduced by 26% when compared to the number of control larvae that had developed normally to the full-shelled, straight-hinged veliger stage. Therefore, the EC50 for quahog embryos-larvae exposed to BAS 514 H was empirically estimated to be greater than 100 mg/L. Based on

criteria established by EPA (1985), this test material (BAS 514 H) would be classified as practically non-toxic to the quahog clam. During the 48-hour test, the temperature was 21°C, the pH ranged from 7.2 to 7.9 and the dissolved oxygen concentration ranged from 6.4 to 7.2 (86% to 97% saturation at 21°C, respectively).

13. **STUDY AUTHOR'S CONCLUSIONS/QUALITY ASSURANCE MEASURES:** No conclusions were made by the author.

A GLP compliance statement was included in the report and the study was audited by a QA unit. A statement of quality assurance was included in the report, indicating that the study was conducted in accordance with U.S. EPA Good Laboratory Practice Standards: Pesticide Programs (40 CFR 160).

14. **REVIEWER'S DISCUSSION AND INTERPRETATION OF STUDY RESULTS:**

A. **Test Procedure:** The test procedures were generally in accordance with protocols recommended by the Guidelines, but deviated from the SEP and ASTM as follows:

o The Acute toxicity of BAS 514H to embryos-larvae of the Quahog clam study number, is listed as 986-0385.6102.514 (page 4). In the report on the analysis of BAS 514 H concentrations used for Estuarian Species Acute Toxicity Studies (Report No. M-864) the study no. is listed as 986-6102-914 (Table IV). Since these numbers do not match it is possible that the analyzed water samples were taken from a source other then test vessels from the definitive Quahog clam study 986-0385.6102.514. This discrepancy has not been addressed.

o Only one sample from each time interval (0, 24, and 48-hours was measured. At least three samples should be analyzed from each time interval.

o The test material was added to filtered seawater and mixed for approximately 21 hours. This may cause the test material to volatilize out of the test solution.

o According to the ASTM, non-viable (heat-killed) sperm should be used to induce female oysters to spawn. In this test, viable sperm were used.

o The SEP states that embryos should be tested within one hour of spawning and after fertilization. This test used embryos 3.5 hours after fertilization.

o The SEP states that temperature should be measured hourly throughout the acclimation and test period in at least one test chamber if the test containers are not in a temperature controlled water bath because air temperature may change more frequently and to a greater extent than water. During the study, the test temperature was measured at 0 and 48 hours of the exposure period.

o The SEP recommends a 16-hour light and an 8-hour dark photoperiod with a 15- to 30-minute transition period between light and dark. The report did not state whether a 15- to 30-minute transition period between light and dark was maintained.

B. **Statistical Analysis:** Statistical analysis was not needed since percent reduction was less than 50%.

C. **Discussion/Results:** This study appears to be scientifically valid. The EC50, based on percentage reduction of normal quahog larvae after 48-hour of exposure to BAS 514 H, was greater than 100 mg/L nominal concentration. Therefore, BAS 514 H is classified as practically non-toxic to quahog clams (Mercenania mercenaria). The no-observed effect concentration (NOEC) was determined to be 100 mg/L nominal concentration.

D. **Adequacy of the Study:**

(1) Classification: Core.

(2) Rationale: N/A

(3) Repairability: N/A

15. **COMPLETION OF ONE-LINER:** Yes, 08-27-89.

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_____ Identity of product impurities.

_____ Description of the product manufacturing process.

_____ Description of quality control procedures.

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_____ Sales or other commercial/financial information.

_____ A draft product label.

_____ The product confidential statement of formula.

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Shaughnessey No. Not available Chemical Name BAS 014 H Chemical Class Quinclorac Page ____ of ____

Study/Species/Lab/ Accession	Chemical % a.i.	Results	Reviewer/ Date	Valid Study
14-Day Single Dose Oral LD_{50}		LD50 = . mg/kg (95% C.L.) Contr. Mort.(%) =		
Species ____		Slope = # Animals/Level = Age(Days) = Sex =		
Lab		14-Day Dose Level mg/kg/(% Mortality) ( ), ( ), ( ), ( ), ( )		
Acc.		Comments:		
14-Day Single Dose Oral LD_{50}		LD50 = mg/kg. (95% C.L.) Contr. Mort.(%) =		
Species ____		Slope = # Animals/Level = Age(Days) = Sex =		
Lab		14-Day Dose Level mg/kg/(% Mortality) ( ), ( ), ( ), ( ), ( )		
Acc.		Comments:		
8-Day Dietary LC_{50}		LC50 = ppm (95% C.L.) Contr. Mort.(%) =		
Species		Slope = # Animals/Level = Age(Days) = Sex =		
Lab ____		8-Day Dose Level ppm/(%Mortality) ( ), ( ), ( ), ( ), ( )		
Acc.		Comments:		
8-Day Dietary LC_{50}		LC50 = ppm (95% C.L.) Contr. Mort.(%) =		
Species		Slope = # Animals/Level = Age(Days) = Sex =		
Lab ____		8-Day Dose Level ppm/(%Mortality) ( ), ( ), ( ), ( ), ( )		
Acc.		Comments:		
48-Hour EC_{50}		LC50 = >100 ppm (95% C.L. N/A) Reduction(%) Contr. Mort.(%) = N/A Sol. Contr. Mort.(%) = N/A	H.R 8/27/89 Con	
Species Mercenania mercenaria		Slope = N/A # Animals/Level = 23,200/replicate Temperature = 21°c		
Lab Springborn Bionomics 96.5%		48-Hour Dose Level ppb (%Reduction) (%Mortality) 100(26), ( ), ( ), ( ), ( )		
MRID # Acc. 410635-52 & 410635-50		Comments: Based on nominal concentration		
96-Hour LC_{50}		LC50 = ppm (95% C.L.) Con. Mor.(%) = Sol. Con. Mor.(%) =		
Species		Slope = # Animals/Level = Temp. =		
Lab ____		96-Hour Dose Level ppb /(%Mortality) ( ), ( ), ( ), ( ), ( )		
Acc.		Comments:		
96-Hour LC_{50}		LC50 = ppm (95% C.L.) Con. Mort.(%) = Sol. Con. Mort.(%) =		
Species		Slope = # Animals/Level = Temp. =		
Lab ____		96-Hour Dose Level ppb /(%Mortality) ( ), ( ), ( ), ( ), ( )		
Acc.		Comments:		

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ATTACHMENT II

Summary of sampling scheme during the 96-Hour exposure of eastern oyster larvae (Crassostrea virginica) to BAS 514H.[a]

Sample ID No.	Date Sampled	Interval Sampled	Analytical[b] Result (mg/L)
		Definitive Test	
1-85-233	12/16/85	0 Hour	12.9
1-85-234	12/16/85	0 Hour	13.2
1-85-235	12/17/85	24 Hour	13.2
1-85-236	12/17/85	24 Hour	14.8
1-85-237	12/18/85	48 Hour	12.7
1-85-238	12/18/85	48 Hour	13.6

a Test repeated 10 September 1986 based on the discrepancy between nominal concentration (100 mg/L) and measured concentrations. Both studies were reported.
b Analytical results supplied by BASF on 25 August 1986.

Summary of sampling scheme during the 96-Hour exposure of quahog clam larvae (Mercenaria mercenaria) to BAS 514H.

Sample ID No.	Date Sampled	Interval Sampled	Analytical[ab] Result (mg/L)
		Definitive Test	
9-86-215	9/10/86	0 Hour	95.8
9-86-216	9/11/86	24 Hour	97.5
9-86-217	9/12/86	48 Hour	95.1

a Analytical results supplied by BASF.
b Nominal concentration = 100 mg/L

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Pages 10 through 11 are not included in this copy.

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