

US EPA ARCHIVE DOCUMENT

(7-12-90)

MRID No. 410635-53  
and 410635-50

DATA EVALUATION RECORD

- 1. **CHEMICAL:** BAS 514 H Quinclorac.  
Shaughnessy Number: Not available. 129974
- 2. **TEST MATERIAL:** BAS 514 H; Lot No. 150-732N; 96.5% Active Ingredient; a grey-colored powder.
- 3. **STUDY TYPE:** Estuarine Invertebrate Toxicity Test.  
Species Tested: Mysidopsis bahia.
- 4. **CITATION:** Surprenant, D.C. 1986. Acute Toxicity of BAS 514 H to Mysid Shrimp (Mysidopsis bahia). Prepared by Springborn Bionomics, Inc., Wareham, Massachusetts. Bionomics Report #BW-86-12-2217. Bionomics Study #986.0385.6102.510. Submitted by BASF Corporation Chemicals Division, Parsippany, New Jersey. MRID No. 410635-53 and 410635-50.

5. **REVIEWED BY:**

Kimberly D. Rhodes  
Associate Scientist  
KBN Engineering and  
Applied Sciences, Inc.

Signature:

Date:

6. **APPROVED BY:**

Michael L. Whitten  
Staff Toxicologist  
KBN Engineering and  
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Signature:

Date:

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

Signature:

Date:

*Henry T. Craven*  
7/12/90  
*Daniel Babcock* 7-12-90

- 7. **CONCLUSIONS:** This study appears scientifically sound and fulfills the Guideline requirements for a 96-hour static acute toxicity study for estuarine and marine shrimp. The 96-hour LC50 of BAS 514 H to the mysid (Mysidopsis bahia) was 69.4 mg/L mean measured concentration. Therefore, BAS 514 H is classified as slightly toxic to mysids. The NOEC was determined to be 21.8 mg/L mean measured concentration.

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5. **REVIEWED BY:**

Kimberly D. Rhodes  
Associate Scientist  
KBN Engineering and  
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Signature: *Kimberly D. Rhodes*  
Date: *August 30, 1989*

6. **APPROVED BY:**

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Date: *8-30-89*

Henry T. Craven, M.S.  
Supervisor, EEB/HED  
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Signature: *Henry T. Craven*  
*7/12/90*  
Date:

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8. RECOMMENDATIONS: N/A

9. BACKGROUND:

10. DISCUSSION OF INDIVIDUAL TESTS: N/A

11. MATERIALS AND METHODS:

- A. Test Animals: Mysids (Mysidopsis bahia) used in this test were obtained from laboratory cultures maintained at the testing facility. Mysids were fed live brine shrimp (Artemia salina) three times daily. The culture water was prepared by filtering and diluting natural seawater collected from the Cape Cod Canal, Bourne, Massachusetts. Deionized well water was used to dilute the filtered seawater to a salinity range of 18 - 22<sup>o</sup>/oo. The mysid culture area received a regulated photoperiod of 16 hours of light and 8 hours darkness. The ambient air temperature in the culture area was controlled in order to maintain the culture solution temperature at 22 ± 1<sup>o</sup>C.
- B. Test System: The toxicity test was conducted under static conditions in 1.6-liter (L) glass vessels each containing 1 L of test solution or dilution water. The test solution depth was 3.5 cm with a surface area of 280 cm<sup>2</sup>. The ambient air temperature in the laboratory was controlled in order to maintain test solution temperatures at 22 ± 1<sup>o</sup>C. The test solutions were not aerated during the test. The photoperiod of the test was the same as in the culture area. The dilution water used was from the same source as the culture water and was characterized as having a salinity of 20 g/L and a pH of 7.8.
- C. Dosage: 96-hour static acute test.
- D. Design: The test was initiated when 10 mysids (1 - 4 days old) were impartially distributed to each concentration and control (five mysids per replicate) within 25 minutes after the test solutions had been prepared. A control and five nominal concentrations of 13, 22, 36, 60 and 100 mg/L were tested in duplicate. Mysids were fed brine shrimp nauplii at 0 and 48 hours of exposure. All concentrations were observed once every 24 hours for mortality and abnormal effects. Analytical determination of BAS 514 H was determined at 0, 48 and 96 hours of exposure. The pH and dissolved

oxygen concentrations were measured in each test concentration and control solution at each 24-hour interval. Temperature and salinity were measured in one replicate vessel of the control at each 24-hour interval.

E. **Statistics:** The concentrations of test substance lethal to 50 percent of the test population (LC50) and 95% confidence intervals was determined at 24-, 48-, 72-, and 96-hour exposure periods by a computerized program developed by Stephan (1982).

12. **REPORTED RESULTS:** The mean measured concentrations of BAS 514 H were 13.1, 21.8, 33.7, 67.2 and 99.5 mg/L. The mean measured concentrations ranged from 94% to 112% of the nominal test concentrations. The concentrations tested, corresponding mortalities and observations made during the toxicity test are presented in Table 1 (attached). All exposure solutions were clear colorless and contained no visible insoluble material (e.g. precipitate). The 96-hour LC50 value and 95% confidence interval for mysid shrimp exposed to BAS 514 H was calculated by probit analysis to be 67 (50 - 110) mg/L based on nominal concentration. The no discernible effect concentration was determined to be 22 mg/L BAS 514 H. The water quality parameters measured during this study remained within acceptable limits for the survival of mysid shrimp.

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 as follows:

o The Mysid shrimp were fed during the test and in the submitted raw data it is stated that "tan granular undissolved matter" was observed on the bottom of the test vessel. If the test material tends to bind to

organic material, the measured test concentrations may not indicate actual availability of the test material to the Mysids.

o In the raw data of a preliminary test it is stated that "test material came out of solution upon addition of stock solution to dilution water". This was at nominal concentrations of 10 and 100 mg/l. If the test solution is suspended in solution and not actually dissolved, the test solution samples should be filtered before they are analyzed for test material concentration. It is not stated in the report whether test material was suspended in the test solutions during the definitive test.

o The SEP states that natural or reconstituted seawater of 10 to 17 ‰ salinity should be used when testing euryhaline shrimp species. The natural seawater used during the toxicity study had a salinity of 20 ‰.

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 and recorded every 24 hours.

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: The reviewer used EPA's Toxanal computer program using mean measured concentrations instead of nominal concentrations to calculate the LC50 values. These calculations are attached. The probit method provides a 96-hour LC50 value of 69.4 mg/L with a 95 percent confidence interval of 50.4 to 118.7 mg/L which is similar as that reported by the author (i.e., 67 mg/L with a 95% confidence interval of 50 to 110 mg/L).

C. Discussion/Results: This study appears to be scientifically valid. The 96-hour LC50 value based upon mean measured concentrations was determined to be

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- Description of quality control procedures.
- Identity of the source of product ingredients.
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- FIFRA registration data.
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Study/Species/Lab/ Accession \_\_\_\_\_ Chemical X a. l. Results \_\_\_\_\_ Reviewer/ Date \_\_\_\_\_ Validity \_\_\_\_\_

14-Day Single Dose Oral LD50 LD50 = mg/kg ( 95% C.L. ) Contr. Mort. (X) = \_\_\_\_\_

Species \_\_\_\_\_ Slope = \_\_\_\_\_ # Animals/Level = \_\_\_\_\_ Age (Days) = \_\_\_\_\_ Sex = \_\_\_\_\_

Lab \_\_\_\_\_ ( 14-Day Dose Level mg/kg / (X Mortality) ) \_\_\_\_\_

Acc. \_\_\_\_\_ Comments: \_\_\_\_\_

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Lab \_\_\_\_\_ ( 14-Day Dose Level mg/kg / (X Mortality) ) \_\_\_\_\_

Acc. \_\_\_\_\_ Comments: \_\_\_\_\_

8-Day Dietary LC50 LC50 = ppm ( 95% C.L. ) Contr. Mort. (X) = \_\_\_\_\_

Species \_\_\_\_\_ Slope = \_\_\_\_\_ # Animals/Level = \_\_\_\_\_ Age (Days) = \_\_\_\_\_ Sex = \_\_\_\_\_

Lab \_\_\_\_\_ ( 8-Day Dose Level ppm / (X Mortality) ) \_\_\_\_\_

Acc. \_\_\_\_\_ Comments: \_\_\_\_\_

8-Day Dietary LC50 LC50 = ppm ( 95% C.L. ) Contr. Mort. (X) = \_\_\_\_\_

Species \_\_\_\_\_ Slope = \_\_\_\_\_ # Animals/Level = \_\_\_\_\_ Age (Days) = \_\_\_\_\_ Sex = \_\_\_\_\_

Lab \_\_\_\_\_ ( 8-Day Dose Level ppm / (X Mortality) ) \_\_\_\_\_

Acc. \_\_\_\_\_ Comments: \_\_\_\_\_

48-Hour LC50 LC50 = PP ( 95% C.L. ) Contr. Mort. (X) = \_\_\_\_\_ Sol. Contr. Mort. (X) = \_\_\_\_\_

Species \_\_\_\_\_ Slope = \_\_\_\_\_ # Animals/Level = \_\_\_\_\_ Temperature = \_\_\_\_\_

Lab \_\_\_\_\_ ( 48-Hour Dose Level pp / (X Mortality) ) \_\_\_\_\_

Acc. \_\_\_\_\_ Comments: \_\_\_\_\_

96-Hour LC50 LC50 = 69.4 PP ( 95% C.L. ) ( 50.4 - 118.7 ) Contr. Mort. (X) = 0 Sol. Contr. Mort. (X) = N/A

Species Mysidopsis bahia Slope = 3.2 # Animals/Level = 10 Temp. = 22 ± 1 °C 8/25/09 Core

Lab Springborn Bionomics ( 96-Hour Dose Level ppm / (X Mortality) ) \_\_\_\_\_

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Comments: Based on mean measured concentrations.

96-Hour LC50 LC50 = PP ( 95% C.L. ) Contr. Mort. (X) = \_\_\_\_\_ Sol. Contr. Mort. (X) = \_\_\_\_\_

Species \_\_\_\_\_ Slope = \_\_\_\_\_ # Animals/Level = \_\_\_\_\_ Temp. = \_\_\_\_\_

Lab \_\_\_\_\_ ( 96-Hour Dose Level pp / (X Mortality) ) \_\_\_\_\_

Acc. \_\_\_\_\_ Comments: \_\_\_\_\_

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CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB. (PERCENT)
99.5	10	7	70	17.1875
67.2	10	4	40	37.69531
33.7	10	3	30	17.1875
21.8	10	0	0	9.765625E-02
13.1	10	0	0	9.765625E-02

THE BINOMIAL TEST SHOWS THAT 0 AND +INFINITY CAN BE USED AS STATISTICALLY SOUND CONSERVATIVE 95 PERCENT CONFIDENCE LIMITS, BECAUSE THE ACTUAL CONFIDENCE LEVEL ASSOCIATED WITH THESE LIMITS IS GREATER THAN 95 PERCENT.

AN APPROXIMATE LC50 FOR THIS SET OF DATA IS 76.47084

RESULTS CALCULATED USING THE MOVING AVERAGE METHOD

SPAN	G	LC50	95 PERCENT CONFIDENCE LIMITS	
3	.2927396	67.58121	49.33737	120.8701

RESULTS CALCULATED USING THE PROBIT METHOD

ITERATIONS	G	H	GOODNESS OF FIT PROBABILITY
5	.2907751	1	.4790638

\* SLOPE = 3.205914  
 95 PERCENT CONFIDENCE LIMITS = 1.477171 AND 4.934657

\* LC50 = 69.42363  
 95 PERCENT CONFIDENCE LIMITS = \* 50.44289 AND 118.7009

LC10 = 27.8846  
 95 PERCENT CONFIDENCE LIMITS = 11.49752 AND 39.76809

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