US EPA ARCHIVE DOCUMENT

72-8
July 7/12/90

MRID No. 410635-56
and 410635-57

DATA EVALUATION RECORD

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

2. **TEST MATERIAL:** One part (by weight) BAS 514 H; Lot No. 150732; 96.2% Active Ingredient; a white powder plus twelve parts (by weight) BAS 864 01S (a viscous yellow liquid).

3. **STUDY TYPE:** Freshwater Invertebrate Static Acute Test. Species Tested: *Daphnia magna*.

4. **CITATION:** Boeri, R.L. 1989. Static Acute Toxicity of BAS 514 H Plus the Surfactant BAS 864 01 S to Daphnids (*Daphnia magna*). Prepared by Enseco Incorporated, Marblehead, Massachusetts. Registration Document No. 89/5028. Submitted by BASF Corporation Chemicals Division, Parsippany, New Jersey. MRID No. 410635-56 and 410635-57.

5. **REVIEWED BY:**

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

Signature:

Date:

6. **APPROVED BY:**

Michael L. Whitten, M.S.
Staff Toxicologist
KBN Engineering and
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Date:

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

Signature: Henry T. Craven

Date: 7/12/90

Daniel Barker 7-12-90

7. **CONCLUSIONS:** This study is scientifically sound and fulfills the guideline requirement for an acute toxicity study using freshwater invertebrates. Under the conditions tested, the 48-hour LC50 for *Daphnia magna* was 29.8 mg a.i./L BAS 514 H mean measured concentration. Therefore, BAS 514 H plus the surfactant BAS 864 01S is considered slightly toxic to *Daphnia magna*. The NOEC was 8.5 mg a.i./L mean measured concentration.

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5. REVIEWED BY:

Kimberly Rhodes
Associate Scientist
KBN Engineering and
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Signature: Kimberly Rhodes

Date: August 30, 1989

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Date: 8-30-89

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8. RECOMMENDATIONS: N/A

9. BACKGROUND:

10. DISCUSSION OF INDIVIDUAL TESTS: N/A

11. MATERIALS AND METHODS:

A. Test Animals: Daphnia magna used in this test were obtained from laboratory cultures maintained at the testing facility. For 14 days prior to testing, adult daphnids were maintained in 100% dilution water under renewal conditions in a 4-L glass culture vessel. Prior to testing, daphnids were fed freshwater algae (Selenastrum capricornutum). Daphnids were in good condition prior to the test as judged by the absence of ephippia and visible signs of stress or disease.

B. Test System: Five concentrations of test material, a dilution water control and a surfactant control were tested in 250-mL glass beakers containing 200 mL of test solution. Test vessels were randomly arranged in an environmental chamber during the 48 hour test. All treatment levels and controls were duplicated. The temperature of the test solutions were maintained at 20 $\pm$ 1°C by the environmental chamber. Aeration was not required. A photoperiod of 16 hours of light and 8 hours of darkness was provided each day.

The dilution water was dechlorinated tapwater and was characterized as having a total hardness adjusted to 40 - 48 mg/L as $CaCO_3$.

C. Dosage: 48-hour acute static test.

D. Design: The test was initiated when 20 daphnids (< 24 hours old) were randomly distributed to two replicates of each treatment (ten daphnids per replicate). Five treatment levels (10, 15, 20, 30, and 50 mg a.i./L), a control and solvent control were tested. Daphnids were not fed during the exposure. The number of surviving organisms and sublethal effects were determined visually and recorded initially and after 24 and 48 hours of exposure. The water quality parameters (dissolved oxygen, pH, conductivity and temperature) were measured in each replicate vessel of the treatment levels and controls. Analytical determination of BAS 514 H was determined at 0 and 48 hours of the exposure.

E. Statistics: Analysis of variance (ANOVA) and Dunnett's procedure were used to compare daphnid survival data from control and test concentration exposures. The no observed effect concentration (NOEC) is the highest concentration tested at which survival is not statistically different than the control. Probit analysis (Staphan, 1983) was used to calculate the 24 and 48 hour median lethal concentration (LC50's) when possible. All calculations were performed using the nominal concentrations of the active ingredient of BAS 514 H.

12. REPORTED RESULTS: The mean measured concentrations of BAS 514 H were 8.5, 13.5, 18.0, 27.8 and 44.4 mg a.i./L. The mean measured concentrations ranged from 85% to 93% of the nominal concentrations. Data generated by the acute toxicity test with BAS 514 H plus BAS 864 01 S and the daphnid, Daphnia magna are presented in Table 2 (attached). One hundred percent survival occurred in both the control and surfactant control exposures. Control daphnids had an average dry weight of 0.025 mg at the termination of the test. All test vessels were initially clear, with no visible precipitate or turbidity. After 24 hours of exposure, all other test vessels were cloudy and remained cloudy until the termination of the test.

The 48-hour LC50 (95% confidence limits) calculated using the nominal concentration of active ingredient (BAS 514 H) is 33.1 mg/L (26.5 - 47.3 mg/L). This level contains 397.2 mg/L of the surfactant BAS 864 01 S. The no observed effect concentration calculated using nominal concentrations of active ingredient is 15 mg/L BAS 514 H. This concentration containes 180 mg/L of the surfactant BAS 864 01 S. No sublethal effects were observed during the test.

The water quality parameters measured during the definitive study remained within acceptable ranges for the survival of Daphnia magna. Daily measurement of temperature demonstrated that the test solution temperature was 19°C, the pH ranged from 7.4 - 7.7 and the dissolved oxygen ranged from 6.8 - 8.9 during the exposure period.

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

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Laboratory Practice Standards: Pesticide Programs (40 CFR 160).

14. REVIEWER'S DISCUSSION AND INTERPRETATION OF STUDY RESULTS

A. Test Procedure: The test procedure used in this study generally follows the SEP except for the following deviations:

o The SEP states that dechlorinated water should not be used because removal of chlorine is rarely complete and residual chlorine can be quite toxic to aquatic organisms. This test used dechlorinated tap water as the dilution water.

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 In the study it is stated that the toxicity test was conducted at a "target temperature range" of 20 plus or minus 1 °C. It was not adequately stated whether this was the actual measured temperature.

o The solubility of the test material is reported to be 64 mg/l in bidistilled water at 20 °C. At cooler temperatures the solubility may be less and thus a portion of the test material may not have been dissolved in the test solution. The test vessels were reported to be cloudy after 24 hours of exposure until the test termination. If the test material is suspended in solution the availability to the test organism may be less then if the test material is completely dissolved.

The toxicity report did not provide the following information required by the SEP:

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 the mean measured concentrations instead of the nominal concentrations to calculate the LC50 values. These calculations are attached. The probit method provides a 48-hour LC50 value of 29.8 mg a.i./L with a 95 percent confidence interval of 23.8 to 42.4 mg a.i./L mean measured concentration which is similar as that reported by the author (i.e., 33.1 mg a.i./L with a 95% confidence interval of 26.5 to 47.3 mg a.i./L nominal concentration). The slope of the dose-response curve was estimated to be 2.9. The reviewer determined the NOEC, based on lack of mortality, to be 8.5 mg a.i./L mean measured concentration.

C. **Discussion/Results:** This study is scientifically valid. Dechlorinated water should not have been used as the dilution water. However, in this test no mortality occurred in the control groups and the residual chlorine was measured to be below the detection limit. The 48-hour LC50 value was determined to be 29.8 mg a.i./L. Therefore, BAS 514 H is considered slightly toxic to Daphnia magna. The NOEC, based on lack of mortality, was determined to be 8.5 mg a.i./L mean measured concentration.

D. **Adequacy of the Study:**

(1) **Classification:** Core.

(2) **Rationale:** Although the test procedures deviated from the guidelines, the reviewer does not believe they significantly affected the toxicity results.

(3) **Repairability:** N/A

15. **COMPLETION OF ONE-LINER:** Yes, 08-29-89.

Shaughnessey No. Not available | Chemical Name BAS 514 H Quinclorac | Chemical Class ____ | Page ____ of ____

Study/Species/Lab/ Accession	Chemical % a.i.	Results	Reviewer/ Date	Valid Stu
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 LC_{50}		LC50 = 29.8 ppm (95% C.L. 23.8 - 42.4) Contr. Mort.(%) = 0		
Species Daphnia magna		Slope = 2.9 # Animals/Level = 20 Sol. Contr. Mort.(%) = 0		
Lab Ensco Incorporated 96.2%		Temperature = 20±1°C	8/29/89	Core
MRID # Acc. 410635-56 + 410635-57		48-Hour Dose Level ppm/(%Mortality): 8.5 (0), 13.5 (10), 18.0 (45), 27.8 (50), 44.4 (60)		
		Comments: Based on mean measured concentrations.		
96-Hour LC_{50}		LC50 = pp__ (95% C.L.) Con. Mort.(%) = Sol. Con. Mor.(%) =		
Species		Slope = # Animals/Level = Temp. =		
Lab ____		96-Hour Dose Level pp /(%Mortality) ( ), ( ), ( ), ( ), ( )		
Acc.		Comments:		
96-Hour LC_{50}		LC50 = pp__ (95% C.L.) Con. Mort.(%) = Sol. Con. Mort.(%) =		
Species		Slope = # Animals/Level = Temp. =		
Lab ____		96-Hour Dose Level pp /(%Mortality) ( ), ( ), ( ), ( ), ( )		
Acc.		Comments:		

KIMBERLY RHODES BAS514H DAPHNIA MAGNA 08-27-89

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CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB. (PERCENT)
44.4	20	12	60.00001	25.17223
27.8	20	10	50	58.80985
18	20	9	45	41.19014
13.5	20	2	10	2.012253E-02
8.5	20	0	0	9.536742E-05

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 27.79999

RESULTS CALCULATED USING THE MOVING AVERAGE METHOD

SPAN	G	LC50	95 PERCENT CONFIDENCE LIMITS	
3	.3327156	27.11742	20.86002	41.44857

RESULTS CALCULATED USING THE PROBIT METHOD

ITERATIONS	G	H	GOODNESS OF FIT PROBABILITY
5	.1783708	1	9.655744E-02

* SLOPE = 2.939994
95 PERCENT CONFIDENCE LIMITS = 1.698318 AND 4.18167

* LC50 = 29.78294
95 PERCENT CONFIDENCE LIMITS = *23.84229 AND 42.37894

LC10 = 11.01524
95 PERCENT CONFIDENCE LIMITS = 6.151319 AND 14.58897

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Page 9 is not included in this copy.

Pages _____ through _____ are not included.

The material not included contains the following type of information:

____ Identity of product inert ingredients.

____ Identity of product impurities.

____ Description of the product manufacturing process.

____ Description of quality control procedures.

____ Identity of the source of product ingredients.

____ Sales or other commercial/financial information.

____ A draft product label.

____ The product confidential statement of formula.

____ Information about a pending registration action.

✓ FIFRA registration data.

____ The document is a duplicate of page(s) _____.

____ The document is not responsive to the request.

The information not included is generally considered confidential by product registrants. If you have any questions, please contact the individual who prepared the response to your request.