

US EPA ARCHIVE DOCUMENT

5-17-89

Accession No. 407009-13

DATA EVALUATION RECORD

- 1. **CHEMICAL:** Ethyltrianol  
Shaughnessey Number: 128997
- 2. **TEST MATERIAL:** HWG-1608 Technical; Batch No. 86 R0082I;  
96.28% active ingredient; an off-white powder
- 3. **STUDY TYPE:** Acute Toxicity Test for Freshwater  
Invertebrates. Species Tested: Daphnia magna
- 4. **CITATION:** Forbis, A. D., 1988. Acute Flow-through of HWG-  
1608 to Daphnia magna. Prepared by Analytical Biochemistry  
Laboratories, Inc., Columbia, Missouri. Submitted by Mobay  
Corporation, Stilwell, Kansas. Accession Number 407009-13.

5. **REVIEWED BY:**

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

Signature: *Kimberly D. Rhodes*

Date: *April 5, 1989*

6. **APPROVED BY:**

Prapimpan Kosalwat  
Staff Toxicologist  
KBN Engineering and  
Applied Sciences, Inc.

Signature: *P. Kosalwat*

Date: *4/5/89*

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

Signature: *Henry T. Craven*  
Date: *5/17/89*  
*Henry T. Craven 5/17/89*

7. **CONCLUSIONS:** The data submitted appears scientifically  
sound and fulfills the Guideline requirements for an acute  
toxicity test for freshwater invertebrates. The 48-hour  
LC50 value for Daphnia magna exposed to HWG-1608 was 4.0 mg  
a.i./L, based on mean measured concentrations. Therefore,  
HWG-1608 is classified as moderately toxic to Daphnia magna.  
The NOEC was determined to be 0.74 mg a.i./L.

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 stocks cultured at the testing facility. The daphnids were cultured and tested in a temperature controlled area at  $20 \pm 2^{\circ}\text{C}$ . A photoperiod of 16-hour daylight, 8-hour darkness with a 30-minute transition period between light and dark was provided each day. During the holding period, the daphnids were fed a suspension of algae (Selenastrum capricornutum) supplemented with a Tetramin, yeast and mixed cereal leaves. Only first-instar daphnids (<24 hours old) were selected for testing.

B. Test System: The test was conducted in a half-liter proportional diluter system described by Mount and Brungs (1967), utilizing a Hamilton Micro Lab 420 syringe dispenser. The diluter delivered five concentrations of HWG-1608, a dilution water control and a solvent control to four replicate one-liter test aquaria. The diluter provided for approximately 6.0 volume replacements per 24-hour period. A photoperiod of 16 hours of light and 8 hours of darkness with a 30-minute transition period was provided. Test temperature was maintained at  $20 \pm 2^{\circ}\text{C}$  by a temperature controlled water bath.

The water parameters of the well water used as dilution water were, total hardness: 225-275 mg/L as  $\text{CaCO}_3$ ; total alkalinity: 325-375 mg/L as  $\text{CaCO}_3$ ; pH: 7.8 to 8.3; dissolved oxygen: 9.2 - 10.1 mg/L; and conductivity: 700 umhos/cm.

C. Dosage: 48-hour flow-through acute test.

D. Design: Forty D. magna ( $\leq 24$  hours old) were impartially distributed to each test concentration (10 per replicate) to initiate the test. A control, solvent control, and five nominal HWG-1608 concentrations of 0.44, 0.72, 1.6, 2.9, and 6.0 mg a.i./L were tested. The solvent control solution contained the maximum amount of dimethylformide (DMF) present in any test concentration (0.050 mL). Survival and abnormal effects of first brood of the organisms were recorded daily.

Exposure concentrations of HWG-1608 were analytically measured at 0 and 48 hours of exposure. The mean measured test concentrations reported were 0.46, 0.74, 1.6, 2.6 and 6.2 mg a.i./L. Water quality parameters of temperature, dissolved oxygen and pH were measured from a composite sample of each of the control, low, middle, and high test concentrations at 0 and 48 hours of testing.

E. **Statistics:** Statistical analysis of the concentration vs. effect data (generally mortality) was obtained by employing a computerized LC50 program developed by Stephan et al. (1978).

12. **REPORTED RESULTS:** Table 5 (attached) presents the mortality rates and water quality parameters measured during the test. The 24- and 48-hour LC50 values for HWG-1608 were >6.2 and 4.2 mg/L, respectively. All results were based on the mean measured concentrations of 0.46, 0.74, 1.6, 2.6, and 6.2 mg/L. The 48-hour no-observed effect concentration based on the lack of mortality and abnormal effects was 0.74 mg/L. The dose-response slope was 3.8 after 48 hours. The abnormal effects of mortality, quiescence, and/or daphnids lying on the bottom of the test vessels were observed in the 1.6, 2.6, and 6.2 mg/L test concentrations.

The measured concentrations of HWG-1608 ranged from 90 to 105% of nominal concentrations throughout the 48 hour test period. The measured concentrations of HWG-1608 dilutor stock solution measured at 0- and 48-hours yielded an average of 93% of nominal (72,000 mg/L).

13. **STUDY AUTHOR'S CONCLUSIONS/QUALITY ASSURANCE MEASURES:** The 24- and 48-hour LC50 values for HWG-1608 were >6.2 and 4.2 mg a.i./L, respectively. The 48-hour no-observed effect concentration based on the lack of mortality and abnormal effects was 0.74 mg/L. The dose-response slope was 3.8 after 48 hours.

A GLP compliance statement was included in the report by the author 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 SEP states that use of a natural dilution water with a hardness of 40 to 48 mg/L as CaCO<sub>3</sub> can be used in lieu of reconstituted water. The dilution water used for the toxicity test had a total hardness range of approximately 225 to 275 mg/L as CaCO<sub>3</sub>.

o The SEP states that each designated treatment group should be exposed to a concentration that is at least 60% of the next highest concentration. During the study, a dilution factor ranged from 45% to 61% of the next highest concentration.

o The SEP states that if the temperature is controlled by a water bath, measurements should be recorded every six hours. During the test, temperature was measured and recorded every 24 hours.

B. Statistical Analysis: The reviewer used the EPA's Toxanal computer program to calculate the 48-hour LC50 value and slope of the concentration response curve. These calculations are attached. Based on mean measured concentrations of HWG-1608, the probit method provides a 48-hour LC50 value of 4.0 mg/L with a 95 percent confidence interval of 3.4 to 4.8 mg/L. The slope of the concentration-response curve was 3.8.

C. Discussion/Results: The data submitted appears scientifically sound and fulfills the Guideline requirements for an acute toxicity test for freshwater invertebrates. The 48-hour LC50 value for Daphnia magna exposed to HWG-1608 was 4.0 mg a.i./L, based on mean measured concentrations. The 48-hour NOEC was 0.74 mg a.i./L, based on mean measured concentration. Therefore, HWG-1608 is classified as moderately toxic to Daphnia magna.

D. Adequacy of the Study:

(1) Classification: Core

(2) Rationale: N/A

(3) Repairability: N/A

15. COMPLETION OF ONE-LINER: Yes, 04-03-89.

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KIMBERLY RHODES ETHYLTRIANOL DAPHNIA MAGNA 04-03-89

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CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB. (PERCENT)
6.2	40	32	80	0
2.6	40	6	15	0
1.6	40	5	12.5	0
.74	40	0	0	0
.46	40	0	0	0

BECAUSE THE NUMBER OF ORGANISMS USED WAS SO LARGE, THE 95 PERCENT CONFIDENCE INTERVALS CALCULATED FROM THE BINOMIAL PROBABILITY ARE UNRELIABLE. USE THE INTERVALS CALCULATED BY THE OTHER TESTS.

AN APPROXIMATE LC50 FOR THIS SET OF DATA IS 4.178533

RESULTS CALCULATED USING THE MOVING AVERAGE METHOD

SPAN	G	LC50	95 PERCENT CONFIDENCE LIMITS	
1	9.991376E-02	4.178533	3.628955	4.854182

RESULTS CALCULATED USING THE PROBIT METHOD

ITERATIONS	G	H	GOODNESS OF FIT	PROBABILITY
4	7.872734E-02	1		.2291482

SLOPE = 3.790114  
95 PERCENT CONFIDENCE LIMITS = 2.726669 AND 4.853559

LC50 = 3.959401  
95 PERCENT CONFIDENCE LIMITS = 3.366275 AND 4.829621

LC10 = 1.830405  
95 PERCENT CONFIDENCE LIMITS = 1.37354 AND 2.217113

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Shaw-Wheeler No. 128997

(HWG-1608)

Chemical Name Ethyltrianol Chemical Class \_\_\_\_\_ Page \_\_\_\_\_ of \_\_\_\_\_

Study/Species/Lab/  
Accession \_\_\_\_\_ Chemical  
# a.i. \_\_\_\_\_

Results \_\_\_\_\_ Reviewer/  
Date \_\_\_\_\_ Validity  
Stat \_\_\_\_\_

14-Day Single Dose Oral LD<sub>50</sub>

LD<sub>50</sub> = mg/kg ( 95% C.L. ) Contr. Mort. (X) = \_\_\_\_\_

Species \_\_\_\_\_

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

Lab \_\_\_\_\_

14-Day Dose Level mg/kg/(% Mortality)  
( ) , ( ) , ( ) , ( ) , ( )

Acc. \_\_\_\_\_

Comments: \_\_\_\_\_

14-Day Single Dose Oral LD<sub>50</sub>

LD<sub>50</sub> = mg/kg. ( 95% C.L. ) Contr. Mort. (X) = \_\_\_\_\_

Species \_\_\_\_\_

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

Lab \_\_\_\_\_

14-Day Dose Level mg/kg/(% Mortality)  
( ) , ( ) , ( ) , ( ) , ( )

Acc. \_\_\_\_\_

Comments: \_\_\_\_\_

8-Day Dietary LC<sub>50</sub>

LC<sub>50</sub> = ppm ( 95% C.L. ) Contr. Mort. (X) = \_\_\_\_\_

Species \_\_\_\_\_

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

Lab \_\_\_\_\_

8-Day Dose Level ppm/(% Mortality)  
( ) , ( ) , ( ) , ( ) , ( )

Acc. \_\_\_\_\_

Comments: \_\_\_\_\_

8-Day Dietary LC<sub>50</sub>

LC<sub>50</sub> = ppm ( 95% C.L. ) Contr. Mort. (X) = \_\_\_\_\_

Species \_\_\_\_\_

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

Lab \_\_\_\_\_

8-Day Dose Level ppm/(% Mortality)  
( ) , ( ) , ( ) , ( ) , ( )

Acc. \_\_\_\_\_

Comments: \_\_\_\_\_

48-Hour LC<sub>50</sub>

LC<sub>50</sub> = 4.0 ppm ( 95% C.L. ) probit analysis Contr. Mort. (X) = 0

Species Daphnia magna

Slope = 3.8 # Animals/Level = 40 Sol. Contr. Mort. (X) = 0

Lab Analytical BioChemistry

48-Hour Dose Level pp/(% Mortality) Temperature = 20.1°C

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0.46 (0) , 0.74 (0) , 1.0 (12) , 1.26 (15) , 6.2 (80)

K.R. 04/05/09 Core

Comments: Based on mean measured concentrations.

96-Hour LC<sub>50</sub>

LC<sub>50</sub> = pp ( 95% C.L. ) Contr. Mort. (X) = \_\_\_\_\_

Species \_\_\_\_\_

Slope = # Animals/Level = \_\_\_\_\_ Sol. Contr. Mort. (X) = \_\_\_\_\_

Lab \_\_\_\_\_

96-Hour Dose Level pp/(% Mortality) Temp. = \_\_\_\_\_  
( ) , ( ) , ( ) , ( ) , ( )

Acc. \_\_\_\_\_

Comments: \_\_\_\_\_

96-Hour LC<sub>50</sub>

LC<sub>50</sub> = PP ( 95% C.L. ) Contr. Mort. (X) = \_\_\_\_\_

Species \_\_\_\_\_

Slope = # Animals/Level = \_\_\_\_\_ Sol. Contr. Mort. (X) = \_\_\_\_\_

Lab \_\_\_\_\_

96-Hour Dose Level pp/(% Mortality) Temp. = \_\_\_\_\_  
( ) , ( ) , ( ) , ( ) , ( )

Acc. \_\_\_\_\_

Comments: \_\_\_\_\_