

122101

72-2420/81

Daphnia
acute w/
TGAI

DATA EVALUATION RECORD

1. CHEMICAL: CGA-64250

2. FORMULATION: Technical - 91%

MEID# 0067925

3. CITATION: Forbis, A.(1980) Acute Toxicity of CGA-64250 to Daphnia magna; received 1/28/81 under 100-618; unpublished report prepared by Analytical Biochemistry Laboratories, Inc. for CIBA-GEIGY Corporation, Greensboro, NC (in acc # 244273)

4. REVIEWED BY: Stephen M. Hopkins
Plant Physiologist
Ecological Effects Branch/HED

5. DATE REVIEWED: 2/20/81

6. TEST TYPE: Aquatic invertebrate LC₅₀ - Daphnia magna

7. REPORTED RESULTS:

The author demonstrated that the 48hr LC₅₀ of the test material to Daphnia magna is 4.8 ppm, with a 95% confidence interval of 3.9-6.2 ppm.

8. REVIEWER'S CONCLUSIONS:

This study is scientifically sound, and meets EPA requirements for an aquatic invertebrate LC₅₀ study.

Testing Laboratory Report

A. Test Procedure

Protocol generally followed EPA proposed guidelines of July 10, 1978. Some specifics of note include:

Number of daphnids - 10 first instar daphnids per beaker, 2 beakers per treatment level.

Dilution water - well water.

Temperature - $20^{\circ} \pm 1^{\circ}\text{C}$.

Treatment levels - 0.56, 1, 1.8, 3.2, 5.6, and 10 ppm, plus untreated and acetone controls.

Chemical analysis - Actual concentrations of toxicant at test initiation were determined by GLC

Test initiation - August 19, 1980

B. Statistical Analysis

Mortality was analyzed using the Stephan computerized LC₅₀ program.

C. Results

<u>Nominal Concentration</u>	<u>Measured Concentration</u>	<u>Mortality at 96hrs</u>
Controls		0
0.56 ppm	0.26 ppm	0
1.0	1.0	5 %
1.8	1.7	0
3.2	4.9	25
5.6	5.0	65
10.0	4.3	85

The author calculated a 48hr LC₅₀ of 4.8 ppm with a 95% confidence interval of 3.9-6.2 ppm.

Reviewer's Evaluation

A. Test Procedure

The procedure generally followed the 1978 EPA guidelines.

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B. Statistical Analysis

Mortality was analyzed in EEB using the probit method, the results of which agreed with the author's findings. When the measured concentrations of test material were used in the calculations, the LC₅₀ was 4.2-5.6 ppm, well within the author's confidence interval.

C. Results/Discussion

The author demonstrated that the 48hr LC₅₀ of CGA-64250 to Daphnia is 4.8 ppm, with confidence limits of 3.9-6.2 ppm.

D. Conclusions

1. Category: Core
2. Rationale: NA
3. Repairability: NA

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Daphnia 48hr LC₅₀

CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB. (PERCENT)
10	20	17	85.	.128841
5.6	20	13	65.	13.1588
3.2	20	5	25	2.06947
1.8	20	0	0	9.53674E-5
1	20	1	5.	2.00272E-3
.56	20	0	0	9.53674E-5

THE BINOMIAL TEST SHOWS THAT 3.2 AND 10 CAN BE USED AS STATISTICALLY SOUND CONSERVATIVE 95 PERCENT CONFIDENCE LIMITS SINCE THE ACTUAL CONFIDENCE LEVEL ASSOCIATED WITH THESE LIMITS IS GREATER THAN 95 PERCENT.

AN APPROXIMATE LC₅₀ FOR THIS SET OF DATA IS 4.55639

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

SPAN	G	LC ₅₀	95 PERCENT CONFIDENCE LIMITS	
3	8.74267E-2	4.87776	4.0374	6.05529

-----RESULTS CALCULATED USING THE PROBIT METHOD

ITERATIONS	G	H	GOODNESS OF FIT PROBABILITY
6	.111297	1	.268434

SLOPE = 3.40526
95 PERCENT CONFIDENCE LIMITS = 2.26922 AND 4.5413

LC₅₀ = 4.81879
95 PERCENT CONFIDENCE LIMITS = 3.89082 AND 6.15739

Daphnia 48hr LC₅₀

CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB. (PERCENT)
5	20	13	65.	13.1588
4.9	20	5	25	2.06947
1.7	20	0	0	9.53674E-5
1	20	1	5.	2.00272E-3
.26	20	0	0	9.53674E-5

THIS DATA SET DOES NOT MEET THE CRITERIA ESTABLISHED BY THE COMMITTEE ON METHODS FOR TOXICITY TESTS WITH AQUATIC ORGANISMS BECAUSE NO PERCENT DEAD IS GREATER THAN 65 PERCENT.

THE BINOMIAL TEST SHOWS THAT 4.9 AND +INFINITY CAN BE USED AS STATISTICALLY SOUND CONSERVATIVE 95 PERCENT CONFIDENCE LIMITS SINCE THE ACTUAL CONFIDENCE LEVEL ASSOCIATED WITH THESE LIMITS IS GREATER THAN 95 PERCENT.

AN APPROXIMATE LC₅₀ FOR THIS SET OF DATA IS 4.96291

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

SPAN	G	LC ₅₀	95 PERCENT CONFIDENCE LIMITS	
1	.604756	4.96291	4.91609	5.05107

-----RESULTS CALCULATED USING THE PROBIT METHOD

ITERATIONS	G	H	GOODNESS OF FIT PROBABILITY
6	2.30327	3.15873	2.35859E-2

SINCE THE PROBABILITY IS LESS THAN 0.05, RESULTS CALCULATED USING THE PROBIT METHOD PROBABLY SHOULD NOT BE USED.

SLOPE = 2.94193
95 PERCENT CONFIDENCE LIMITS = -1.5229 AND 7.40677

LC₅₀ = 5.60021
95 PERCENT CONFIDENCE LIMITS = 0 AND +INFINITY

Daphnia 48hr LC50
measured concentrations

CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB.(PERCENT)
5	20	13	65.	13.1588
4.9	20	5	25	2.06947
4.3	20	17	85.	.128841
1.7	20	0	0	9.53674E-5
1	20	1	5.	2.00272E-3
.26	20	0	0	9.53674E-5

THE BINOMIAL TEST SHOWS THAT 1.7 AND +INFINITY CAN BE USED AS STATISTICALLY SOUND CONSERVATIVE 95 PERCENT CONFIDENCE LIMITS SINCE THE ACTUAL CONFIDENCE LEVEL ASSOCIATED WITH THESE LIMITS IS GREATER THAN 95 PERCENT.

AN APPROXIMATE LC50 FOR THIS SET OF DATA IS 4.13175

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

SPAN	G	LC50	95 PERCENT CONFIDENCE LIMITS	
5	.257449	4.45315	3.77077	5.41791

-----RESULTS CALCULATED USING THE PROBIT METHOD

ITERATIONS	G	H	GOODNESS OF FIT PROBABILITY
6	1.96263	5.47018	0

A PROBABILITY OF 0 MEANS THAT IT IS LESS THAN 0.001

SINCE THE PROBABILITY IS LESS THAN 0.05, RESULTS CALCULATED USING THE PROBIT METHOD PROBABLY SHOULD NOT BE USED.

SLOPE = 3.32429
95 PERCENT CONFIDENCE LIMITS = -1.33284 AND 7.98142

LC50 = 4.24552
95 PERCENT CONFIDENCE LIMITS = 0 AND +INFINITY

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