

US EPA ARCHIVE DOCUMENT

DATA EVALUATION RECORD

1. CHEMICAL: MGK 264
2. TEST MATERIAL: MGK technical, 92.9% purity
3. STUDY TYPE: Acute Toxicity Test for Freshwater Invertebrates
4. CITATION: Blakemore, G.C. and D. Burgess. 1990. Acute Flow-Through Toxicity of MGK-264 to Daphnia magna). Performing laboratory; Analytical Bio-Chemical Laboratories, Inc., Columbia, MO. Study sponsor; McLaughlin Gormley King Company, Minneapolis, MN. Accession No. 415261-02.
5. REVIEWED BY:  
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*Greg Susanke 12/19/90*
6. APPROVED BY:  
Les Touart, Acting Section Head  
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*LT 1/29/91*
7. CONCLUSION: This study appears scientifically sound and fulfills Guideline requirement 72-2, for a freshwater aquatic invertebrate toxicity study. MGK-264 is moderately toxic to Daphnia magna since the LC50 is 2.3 ppm.

8. MATERIALS AND METHODS:

A. Test Organisms:

Species- Daphnia magna

Supplier- ABC Laboratories in-house culture

Age- first instar (< 24-hours old)

Acclimation period- During the holding period the temperature was 20 °C, lighting was 50-70 footcandles with 16 hours of light and a 30 minute transition period. Daphnids were fed algae and trout chow/yeast suspension but were not fed during the 48-hour study.

B. Test System:

Source of dilution water- reconstituted hard blended water (well water/R.O. water mix and four salts )

Water temperature- maintained by 20 °C ± 1 °C water bath

pH- 7.9 - 8.1

Dissolved oxygen- 9.4 - 9.6 mg/l at 0 hour, and 9.0 - 9.3 mg/l after 48 hours (103 - 110% saturation at 20 °C)

Total hardness- 160 - 180 mg/l as CaCO<sub>3</sub>

Total Alkalinity- 136 - 144 mg/l as CaCO<sub>3</sub>

Specific conductance- 410 - 440 uMHOS/cm

Total organic carbon- <1 mg/l

Test aquaria- 1 L glass beakers

Type of dilution system- A half-liter proportional diluter

Flow rate- 5.1 total volume changes per day

Biomass loading rate- approximately 1 daphnid per 100 ml of solution

Photoperiod- 16 hours of light and 8 hours of dark, which included 30 minutes transition period. Cool white fluorescent lights with 50-70 footcandles were used.

C. Test Design:

Range finding test- A static preliminary test used 0.1, 1.0 and 10 ppm. No mortality occurred at 0.1 or 1.0 ppm but 100% mortality occurred at 10 ppm after 24 hours.

Definitive test

Nominal concentrations- .3, 0.6, 1.3, 2.5, 5.0 ppm

Controls- water control, and solvent control - 0.049 ml of acetone, which was the amount received in each treatment levels

Number of test organisms- 10 organisms per container for each treatment level and each control. There were four replicates.

Biological observations- All containers were observed at 24 and 48 hours for mortality and abnormal effects.

Water parameter measurements- Temperature, pH, and DO were measured in each test concentration and control at 0 hour and 48 hours. The temperature in the water bath was measured continuously.

9. REPORTED RESULTS:

Mean measured concentrations- Concentrations were measured by Gas Liquid Chromatography at 0 hour and 48 hours. The mean measured concentrations are 0.34, 0.64, 1.0, 1.9 and 4.5 ppm. Mean measured concentrations were  $93 \pm 16.9\%$  of the nominal concentrations.

Recovery of chemical- ranged from 87% of nominal at 0 hour, and 101% of nominal at 48 hours

Mortality and observations- One mortality (or 2.5%) was observed in the solvent control and at 0.64 ppm. There was 32% mortality at 1.9 ppm, and abnormal behavior such as erratic movement, being quiescent, or remaining on the bottom. There was 100% mortality at 4.6 ppm after 24 hours.

10. STUDY AUTHORS'S CONCLUSIONS / QUALITY ASSURANCE MEASURES:

The 48 hour LC50 was calculated by the Binomial Method and has been determined to be 2.3 ppm. The confidence limits are 1.9 - 4.6 ppm and the NOEL is 1.0 ppm.

Quality Assurance and Good Laboratory Practice Regulation Statements were included in the report, indicating that the study was conducted in accordance with the FIFRA Good Laboratory Practice Standards set forth in 40 CFR Part 160.

11. REVIEWER'S DISCUSSION AND INTERPRETATION OF STUDY RESULTS:

A. Test Procedure: Test procedures were generally in accordance with protocols recommended by the Guidelines.

B. Statistical Analysis: Statistical Analysis was performed using the EEB Toxanal Computer Program. The LC50 was determined by the Binomial Method.

C. Discussion/Results: This study appears scientifically valid. Based on mean measured concentrations the 48 hour LC50 is 2.3 ppm. Therefore, MGK-264 is moderately toxic to freshwater aquatic invertebrates. No confidence limits could be calculated. The NOEL is .34 ppm.

D. Adequacy of the Study:

1. Classification: Core

2. Rationale: N/A

3. Repairability: N/A

12. COMPLETION OF ONE-LINER FOR STUDY: yes