

US EPA ARCHIVE DOCUMENT

(8-31-92)

MRID No. 416100-05

**DATA EVALUATION RECORD**

- 1. **CHEMICAL:** Monosodium acid methanearsonate (MSMA).  
Shaughnessey number: 013803
- 2. **TEST MATERIAL:** Monosodium acid methanearsonate (MSMA); 51% active ingredient; a brown liquid.
- 3. **STUDY TYPE:** Acute Toxicity Test For Freshwater Fish.  
Species tested: Bluegill sunfish (Lepomis macrochirus).
- 4. **CITATION:** Graves, W.C. and G.T. Peters. 1990. MSMA: A 96-Hour Flow-through Acute Toxicity Test with the Bluegill (Lepomis macrochirus). Laboratory Project Number 296A-102. Prepared by Wildlife International Ltd., Easton, Maryland. Submitted by MAA (MSMA/DSMA) Research Task Force Three. Luxemborg Industries (PAMOL), Ltd., Tel Aviv, Israel. EPA MRID No. 416100-05.

5. **REVIEWED BY:**

Richard C. Petrie  
Agronomist  
EEB/EFED/OPP

Signature: *Richard C. Petrie*  
Date: 8/06/92

6. **APPROVED BY:**

Daniel Rieder  
Head, Section 3  
EEB/EFED/OPP

Signature: *Daniel Rieder*  
Date: 8-31-92

- 7. **CONCLUSIONS:** This study is scientifically valid and fulfills the guideline requirements for a 96-hour acute toxicity Study for a warmwater fish species. The 96-hour LC<sub>50</sub> based upon nominal concentrations of MSMA to bluegill sunfish (Lepomis macrochirus) was >51 mg ai/L (>100 mg/L formulated test material) which places this compound in a "practically non-toxic" category. The no-observed-effect concentration (NOEC) was determined to be 100 mg/L.

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8. RECOMMENDATIONS: N/A.

9. BACKGROUND:

10. DISCUSSION OF INDIVIDUAL TESTS: N/A.

11. MATERIALS AND METHODS:

- A. Test Animals: Bluegill sunfish (Lepomis macrochirus) used in this test were obtained from Fattig Fish Hatchery, Brady, Nebraska, 21 days prior to test initiation. The fish were held at a temperature ranging from 16.2 to 18.5°C and did not deviate more than 3 degrees in any 72-hour period. The fish were fed frozen brine shrimp and flake food during acclimation. Bluegill used for this study had a mean weight of 0.86 grams (g) with a range of 0.71 to 1.03 g. Length ranged from 31 to 37 mm with a mean of 34 mm. Loading biomass of the dilution water control was reported to be 0.1 g/L/24 hours during the definitive test.
- B. Test System: The test was conducted in a continuous flow, proportional diluter system which provided at least 5 volume additions of test solution every 24 hours. Test chambers were Teflon-lined, 25-L polyethylene aquaria filled to a depth of 17 cm with 15 L of test solution. Temperature was maintained at 22 ± 1°C by a water bath. Photoperiod was 16 hours of light and 8 hours of darkness with a 30 minute transition period. Dilution water was well water filtered to 0.2 µm prior to introduction into the test system. Dilution water chemistry is provided in Table 1 (attached).
- C. Dosage: Ninety-six-hour flow-through test. Five nominal concentrations of the test substance were tested: 13, 22, 36, 60, and 100 mg/L. The stock solution was not adjusted for the purity or strength of the test substance. No solvent was used to solubilize the test material.
- D. Design: Five concentrations and a control were selected for the study. Treatments were duplicated. Ten bluegill were randomly distributed to each replicate providing 20 fish per treatment. All organisms were observed once every 24 hours for mortality and abnormal behavior. DO concentration and pH were measured in one replicate daily in each

treatment. Temperature was measured in all replicates in all treatments at the beginning and end of the test. Also, a continuous measurement of temperature was made in one replicate of the control throughout the study. Fish were not fed during the study. It was mentioned that samples were collected for chemical analysis during the test but no mention was made as to frequency, method of analysis or results.

E. Statistics: No statistical analysis was performed due to lack of mortality in any treatment.

12. REPORTED RESULTS: The results of the test are presented in Table 3 (attached).

The concentrations of MSMA were measured, however, no results were given.

The reported 24-, 48-, 72- and 96-hour LC<sub>50</sub>'s, based upon nominal concentrations were all greater than 100 mg/L. The NOEC of MSMA was also reported to be 100 mg/L.

During the course of the study, DO concentrations ranged from 7.9 mg/L to 9.2 mg/L (91% - 106% of saturation). The pH ranged from 7.6 to 8.4. Temperature ranged from 21.6 to 22.0°C.

13. STUDY AUTHOR'S CONCLUSIONS/QUALITY ASSURANCE MEASURES: No conclusions were made by the authors.

A GLP compliance statement was included in the report and the study was audited by Wildlife international Ltd.'s Quality Assurance Unit. A statement of quality assurance was included in the report, indicating that the study was conducted in accordance with Good Laboratory Practice Standards as set forth in 40 CFR Part 160.

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

A. Test Procedure: Test procedures were generally in accordance with protocols recommended by the Guidelines, but deviated from the SEP as follows:

- o It was not stated in the report whether a range-finding test was conducted.
- o The type of length (e.g. standard or total) of fish used in the study was not specified.

- B. **Statistical Analysis:** No analyses were performed to calculate  $LC_{50}$ 's as there was no effect in any test concentration.
- C. **Discussion/Results:** This study is scientifically sound and fulfills the guideline test requirement for a warm freshwater fish species. The 96-hour  $LC_{50}$  based upon nominal concentrations of MSMA was  $>100$  mg/L as whole test material. The NOEC was 100 mg/L.
- D. **Adequacy of the Study:**
- (1) **Classification:** Core.
  - (2) **Rationale:** N/A.
  - (3) **Repairability:** N/A.

15. **COMPLETION OF ONE-LINER:** Yes, March 19, 1991.