MRID No. 418890-05

DATA EVALUATION RECORD

1. **CHEMICAL:** Mepiquat chloride.
Shaughnessey No. 109101.

2. **TEST MATERIAL:** Mepiquat chloride; Batch No. WW 285; 99% active ingredient: a powder.

3. **STUDY TYPE:** Freshwater Fish Static Acute Toxicity Test. Species Tested: Bluegill Sunfish (*Lepomis macrochirus*).

4. **CITATION:** Munk, R. 1991. Report on the Study of the Acute Toxicity of Mepiquat Chloride on the Bluegill. Registration Document No. 91/10227. Prepared by BASF Aktiengesellschaft, Department of Toxicology, Limburgerhof, Germany. Submitted by BASF Corporation, Agricultural Chemicals Group, Research Triangle Park, NC. EPA MRID No. 418890-05.

5. **REVIEWED BY:**

Mark A. Mossler, M.S.
Associate Scientist
KBN Engineering and
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Signature: Mark A. Mossler
Date: 1/16/92

6. **APPROVED BY:**

Pim Kosalwat, Ph.D.
Senior Scientist
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Signature: P. Kosalwat
Date: 1/16/92

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

Signature: 6/30/93
Henry T. Craven
Date: 8/13/93

7. **CONCLUSIONS:** This study is scientifically sound but does not meet the guideline requirements. The test concentration was less than 100 mg/l but not high enough to produce any effects or a precise LC_{50}. The 96-hour LC_{50} of >89 mg/l (based on mean measured concentrations) classifies mepiquat chloride as slightly toxic to bluegill sunfish. The NOEC was 89 mg/l.

8. **RECOMMENDATIONS:** N/A.

9. **BACKGROUND:**

2028085

6.5 hrs

10. **DISCUSSION OF INDIVIDUAL TESTS:** N/A.

11. **MATERIALS AND METHODS:**

A. **Test Animals:** Bluegill sunfish (*Lepomis macrochirus* Raf.) were obtained from Osage Catfisheries, Inc. in Osage Beach, MO, and held in flowing tap-water (carbon filtered) for approximately one month. Upon arrival, fish were treated with malachite green twice (0.05 mg/l) and once with tetracycline hydrochloride (10 mg/l). During holding, the temperature was 20-22°C, the dissolved oxygen (D.O.) was greater than 60% of saturation, the pH was approximately 8, the hardness was 2.5 mmol/l (1 mmol $CaCO_3$/l = 100 mg $CaCO_3$/l) and the alkalinity was 5.5 mmol/l. The fish were fed a commercially available fish food *ad libitum* with occasional supplements of live and frozen *Artemia*.

The fish were acclimated to test conditions for two weeks in which there was no mortality. Fish were not fed during the last 24-hours of acclimation or during the test. Weight and length of the fish were 0.39 g (range of 0.30-0.55 g) and 3.3 cm (range of 3.0-3.5 cm).

B. **Test System:** Vessels used in the test were glass aquaria with stainless steel frames (80 x 35 x 46 cm) containing 100 l of reconstituted water (control) or test solution. The reconstituted water was prepared to yield a total hardness of 2.5 mmol/l, an alkalinity of 0.8 mmol/l, and a pH of 8.0. A 16-hour light/8-hour dark photoperiod was used. The test temperature was 21-22°C.

The test concentrations were prepared by adding appropriate amounts of the test material directly to the test chambers.

C. **Dosage:** Ninety-six-hour static test. Based on a preliminary test, two nominal concentrations (100 and 50 mg/l) and a dilution water control were used.

D. **Design:** Ten fish were randomly distributed to each test chamber. The 100 mg/l concentration was replicated three times and the 0 and 50 mg/l treatments were not replicated. Biomass loading rate in the aquaria was 0.04 g/l. All chambers were observed once at 1, 4, 24, 48, 72, and 96 hours for mortality and sublethal effects.

The D.O., pH, and temperature were monitored every 24 hours in the test aquaria. Additionally, the temperature of the control aquarium was monitored continuously beginning from day 2 of the study.

The concentrations of mepiquat chloride were measured in all test solutions at test initiation and at termination using mobile phase ion-chromatography (MPIC).

E. **Statistics:** The 96-hour median lethal concentration (LC_{50}) was calculated using probit analysis.

12. **REPORTED RESULTS:** No undissolved material was observed in the test chambers. Measured concentrations are given on page 10 (attached). At test initiation and termination, measured concentrations were between 95-101% and 78-97% of nominal, respectively.

The mortality and behavioral responses of the bluegill are given on page 7 (attached). The 96-hour LC_{50}, based on nominal concentrations, was >100 mg/l. The no-observed-effect concentration (NOEC) was 100 mg/l (nominal).

The D.O. of the test solutions ranged from 6.1 to 7.8 or 69 to 89% of saturation. The pH ranged from 7.2 to 8.0. The daily temperature was 21-22°C and the continuous temperature range was 22.7-23.2°C.

13. **STUDY AUTHOR'S CONCLUSIONS/QUALITY ASSURANCE MEASURES:** The author presented no conclusions.

A Quality Assurance Statement was included in the report. Another statement was included which stated that the study did not meet the Good Laboratory Practice requirements of 40 CFR 160 but was conducted in accordance with OECD Guidelines, Paris, 1981.

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

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

The hardness of the dilution water, 2.5 mmol/l (250 mg/l), was higher than recommended (no greater than 200 mg/l).

The period of time between test solution preparation and test initiation was not given in the report. Fish should be placed into the test solutions within 30 minutes of solution preparation.

A 30-minute dawn/dusk simulation is recommended in the SEP. No transition period between light and dark was used in the study.

B. **Statistical Analysis:** The reviewer computed the mean measured concentration to be 89 mg/l. Therefore, the LC_{50} is >89 mg/l and the NOEC is 89 mg/l.

C. **Discussion/Results:** It is apparent that mepiquat chloride is not very toxic to bluegill sunfish. However, the mean measured concentration derived by the reviewer (89 mg/l) is less than 100 mg/l at which level only one concentration is required for the test. If the study is repeated, a higher level of toxicant should be used to ensure that the concentrations are 100 mg/l or greater.

This study is scientifically sound but does not meet the guideline requirements. The 96-hour LC_{50} of >89 mg/l (based on mean measured concentrations) classifies mepiquat chloride as slightly toxic to bluegill sunfish. The NOEC was 89 mg/l.

D. **Adequacy of the Study:**

(1) **Classification:** Supplemental.

(2) **Rationale:** The test concentration was <100 mg/l, but not high enough to produce any effects or a precise LC_{50}.

(3) **Repairability:** No.

15. **COMPLETION OF ONE-LINER FOR STUDY:** Yes, 12-11-91.

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Mepiquat Chloride MRID 418890-05

Page _____ is not included in this copy.

Pages 5 through 6 are not included in this copy.

The material not included contains the following type of information:

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Shaughnessey # 109101 Chemical Name Mepiquat chloride Chemical Class _____ Page 1 of 1

Study/Species/Lab/ MRID # | Chemical % a.i. | Results | Reviewer/ Date | Validation Status

48-Hour EC_{50}

_____ EC_{50} = _____ pp (95% C.L.) Control Mortality (%) =

Solvent Control Mortality (%) =

Species:

Slope = # Animals/Level =

Lab:

Temperature =

MRID # 48-Hour Dose Level pp /(% Effect)

( ), ( ), ( ), ( ), ( )

Comments:

96-Hour LC_{50}

99% LC_{50} = > 89 ~~pp~~ mg/l* (95% C.L. N/A) Control Mortality (%) = 0%

Solvent Control Mortality (%) = N/A

Species:

Lepomis macrochirus

Slope = N/A # Animals/Level = 30

Lab:

Temperature = 25°C

BASF

MRID # 96-Hour Dose Level pp mg/l* /(% Mortality)

50 (0), 100 (0), ( ), ( ), ( ) M. Mosier 12/11/91 Supplemental

41889-05

Comments:

NOEC = 89 mg/l*

*Based on measured concentration (mean)