

US EPA ARCHIVE DOCUMENT

(9.15.92)

MRID No. 418695-07

DATA EVALUATION RECORD

- 1. **CHEMICAL:** Cimectacarb.
Shaughnessey No. 112602.
- 2. **TEST MATERIAL:** CGA-163935 Technical; Batch No. 891393;
92.2% active ingredient; a dark amber liquid.
- 3. **STUDY TYPE:** Freshwater Fish Acute Flow-Through Toxicity
Test. Species Tested: Channel Catfish (*Ictalurus punctatus*).
- 4. **CITATION:** Sousa, J.V. 1991. (CGA-163935 Technical) -
Acute Toxicity to Channel Catfish (*Ictalurus punctatus*).
Under Flow-Through Conditions. SLI Report No. 90-11-3579.
Performed by Springborn Laboratories, Inc., Wareham, MA.
Submitted by CIBA-GEIGY Corporation, Greensboro, NC. EPA
MRID No. 418695-07.

5. **REVIEWED BY:**

Rosemary Graham Mora, M.S.
Associate Scientist
KBN Engineering and
Applied Sciences, Inc.

Signature: *Rosemary Graham Mora*
Date: 7/24/92

6. **APPROVED BY:**

Louis M. Rifici, M.S.
Associate Scientist
KBN Engineering and
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Approved: *Blue Montague*
Signature: *Louis M. Rifici*
Date: 7/27/92

Henry T. Craven, M.S.
Supervisor, EEB/EFED
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Signature: *Henry T. Craven*
Date: 9/15/92

7. **CONCLUSIONS:** This study is scientifically sound and meets
the guideline requirements for an acute flow-through
toxicity study using freshwater fish. Based on mean
measured concentrations, the 96-hour LC₅₀ of CGA-163935
Technical for *Ictalurus punctatus* was 35 mg a.i./l which
classifies CGA-163935 Technical as slightly toxic to channel
catfish. The NOEC was 20 mg a.i./l. slope = 10.2

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

9. **BACKGROUND:**

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

11. MATERIALS AND METHODS:

- A. **Test Animals:** Channel catfish (*Ictalurus punctatus*) were obtained from Osage Catfish Farms, Osage Beach, MO. The fish were held in a 500-l tank with flowing well water (21-22°C) for a minimum of 14 days. The well water had a pH of 6.5-6.8, a conductivity of 110-140 $\mu\text{mhos/cm}$, and a total hardness and alkalinity of 35-36 and 20-23 mg/l as CaCO_3 , respectively. The fish were fed daily a commercial diet except during the 48 hours prior to testing.

A representative sample of the test organism population had a mean standard length and weight of 54 (range of 46-62) mm and 1.24 (range of 0.72-1.81) g, respectively. In the 48 hours prior to test initiation, no mortality in the test organism population was observed.

- B. **Test System:** The test system consisted of an intermittent-flow proportional diluter, a temperature-controlled water bath, and 14 glass aquaria (39 x 20 x 25 cm) with 19.5-cm high standpipes which maintained a constant solution volume of 15/L. The flow rate to each aquarium (500 ml/minute) was adequate to provide 6.5 volume replacements every 24 hours. The diluter system was allowed to equilibrate for a minimum of 24 hours prior to test initiation.

The aquaria were impartially positioned in a water bath which was designed to maintain the test temperature at $22 \pm 1^\circ\text{C}$. The photoperiod was 16 hours of light at an intensity range of 22-42 footcandles (238-454 lux). Sudden transitions from light to dark and dark to light were avoided.

The dilution water was well water (from the same source as the water used during holding) with a pH of 7.2, a conductivity of 130-140 $\mu\text{mhos/cm}$, and a hardness and alkalinity of 36 and 20-23 mg/l as CaCO_3 , respectively.

A stock solution (784 mg a.i./l) was prepared by dissolving 85.07 g (78.43 g as a.i.) of test material in dimethylformamide (DMF) to a final volume of 100 ml. The stock solution was delivered to the diluter system where it was diluted with well water to provide the highest test concentration (75 mg a.i./l). Subsequent proportional dilutions provided the remaining 4 concentrations.

- C. **Dosage:** Ninety-six-hour flow-through test. Based on results of preliminary testing, five nominal concentrations were used (13, 21, 32, 49, and 75 mg a.i./l). In addition, a dilution water control and solvent control (0.096 ml DMF/l) were included.
- D. **Design:** Ten fish were impartially loaded into each of two replicate aquaria per treatment (20 fish/treatment level). The organism loading rate was 0.13 g/l/day. The fish were not fed during the study.

Biological observations and observations of physical characteristics of the test solutions were noted at test initiation and every 24 hours. Dead fish were removed at each observation interval.

The dissolved oxygen concentration, pH, and temperature were measured daily. The temperature in one replicate of the control solution was monitored continuously. Total hardness and alkalinity of each exposure and control solution were determined at test initiation.

Chemical analysis of CGA-163935 Technical was performed using high pressure liquid chromatography on each test solution collected on days 0 and 4 to verify the test concentrations.

- E. **Statistics:** The author used a computer program by Stephan (1977, 1982) to calculate LC₅₀ values.

12. **REPORTED RESULTS:** The mean measured concentrations were 12, 20, 31, 45, and 76 mg a.i./l (Table 3, attached). The coefficients of variation averaged 4% for all mean measured concentrations. A viscous film of undissolved test material was observed in the highest test concentration throughout the test period.

No mortality or sublethal effects were observed in the controls or the two lowest concentrations during the study (Table 4, attached).

The 96-hour LC₅₀ for *Ictalurus punctatus* exposed to CGA-163935 Technical was 35 mg a.i./l mean measured concentration (95% confidence interval of 31-45 mg a.i./l). The slope of the concentration-response curve was 10.2. The NOEC was 20 mg a.i./l.

During the study, the temperature was 22.4-24.5°C, the pH was 6.0-7.1, the conductivity was 100-120 µmhos/cm, and the dissolved oxygen concentration was 6.9-9.9 mg/l (82-115% of

saturation). The total hardness and alkalinity were 30-32 and 22-24 mg/l as CaCO₃, respectively.

13. **STUDY AUTHOR'S CONCLUSIONS/QUALITY ASSURANCE MEASURES:**

"Based on criteria established by EPA (1985), CGA-163935 Technical is classified as slightly toxic to channel catfish (*Ictalurus punctatus*)."

Good Laboratory Practice Compliance and quality assurance statements were included in the report, indicating that the study was in accordance with GLP regulations (40 CFR, Part 160) except for the stability, characterization and verification of the test substance identity.

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

A. **Test Procedure:** The test procedures were in accordance with the SEP, except for the following deviations:

The hardness of the dilution water was 30-32 mg/l as CaCO₃; the SEP recommends a hardness range of 40-200 mg/l as CaCO₃.

The age of the test organisms was not reported.

The fish were impartially selected and distributed to the test chambers; random distribution to the test vessels is required.

B. **Statistical Analysis:** The reviewer used EPA's Toxanal computer program to calculate the LC₅₀ value and obtained the same results as the author (printout, attached).

C. **Discussion/Results:** This study is scientifically sound and meets the guideline requirements for an acute flow-through toxicity study using freshwater fish. Based on mean measured concentrations, the 96-hour LC₅₀ was 35 mg a.i./l which classifies CGA-163935 Technical as slightly toxic to channel catfish (*Ictalurus punctatus*). The NOEC was 20 mg a.i./l.

D. **Adequacy of the Study:**

(1) **Classification:** Core.

(2) **Rationale:** N/A.

(3) **Repairability:** N/A.

15. COMPLETION OF ONE-LINER FOR STUDY: Yes, July 20, 1992.

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Pages 6 through 7 are not included in this copy.

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