4-15-93

MRID No. 147863

DATA EVALUATION RECORD

1. **CHEMICAL:** Triadimefon
   Shaughnessey number: 109901

2. **TEST MATERIAL:** Bayleton 50% Wettable Powder; Batch No. 1030212; CAS No. 43121-43-3; 50% active ingredient (Triadimefon); a white powder.

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

4. **CITATION:** Carlisle, J.C. 1984. Acute Toxicity of ®BAYLETON 50% Wettable Powder to Bluegill Sunfish (Lepomis macrochirus). Study No. 84-066-09. Prepared by Environmental Health Research, Mobay Chemical Corporation, Stilwell, KS. Submitted by Mobay Chemical Corporation, Stilwell, KS. EPA MRID No. 147863 or 460087004.

5. **REVIEWED BY:**

   Dennis J. McLane, Wildloife Biologist
   Section 1, Ecological Effects Branch
   Environmental Fate and Effects Division

   Signature: Dennis J. McLane
   Date: 4-6-93

6. **APPROVED BY:**

   Les Touart, Chief, Section 1
   Ecological Effects Branch
   Environmental Fate and Effects Branch

   Signature: L Touart
   Date: 4-15-93

7. **CONCLUSIONS:** This study is scientifically sound but does not fulfill the requirements for a 96-hour static acute toxicity study. Based on nominal concentrations, the 96-hour LC_{50} of Bayleton 50% Wettable Powder to bluegill sunfish was 24.7 ppm. This value classifies Bayleton 50% Wettable Powder as slightly toxic to bluegill sunfish. The NOEC was estimated as 15 ppm. The study report does not fully describe the materials and methods. The test used dilution water with much greater hardness than the recommended range. In addition hard water may have reduce the availability of the product to the organism.

8. **RECOMMENDATIONS:** See Section 14.D.(3).

9. **BACKGROUND:**

MRID No. 00-147863

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   Shaughnessey number: 109901

2. **TEST MATERIAL:** Bayleton 50% Wettable Powder; Batch No. 1030212; CAS No. 43121-43-3; 50% active ingredient (Triadimefon); a white powder.

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5. **REVIEWED BY:**

   Louis M. Rifici, M.S.
   Associate Scientist II
   KBN Engineering and
   Applied Sciences, Inc.

   Signature: Louis M Rifici
   Date: 1/23/91

6. **APPROVED BY:**

   Pim Kosalwat, Ph.D.
   Senior Scientist
   KBN Engineering and
   Applied Sciences, Inc.

   Signature: P. Kosalwat
   Date: 1/23/91

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

   Signature:
   Date:

7. **CONCLUSIONS:** This study is scientifically sound but does not fulfill the requirements for a 96-hour static acute toxicity study. Based on nominal concentrations, the 96-hour LC_{50} of Bayleton 50% Wettable Powder to bluegill sunfish was 24.7 ppm. This value classifies Bayleton 50% Wettable Powder as slightly toxic to bluegill sunfish. The NOEC was estimated as 15 ppm. The study report does not fully describe the materials and methods and the test used dilution water with much greater hardness than the recommended range.

9 hrs

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 a commercial supplier in Kansas and acclimated to test temperature for at least 5 days. Fish were fed Ralston Purina Trout Chow. Mean body weight was 6.96 grams at test commencement.

B. **Test System:** Weighed quantities of Bayleton 50% Wettable Powder were mixed with 50 liters of filtered (carboxylic acid resin and activated carbon) Johnson County municipal tap water in 75-liter aquaria. Water quality characteristics for the dilution water were reported as having a hardness of 170 mg/L as $CaCO_3$ and alkalinity of 68 mg/L as $CaCO_3$. The temperature ranged from 18 to 20°C. The photoperiod was 16-hours light daily. The fish were not fed during the test.

C. **Dosage:** Ninety-six-hour static test. Five nominal concentrations (10, 15, 22.5, 33.8 and 50.6 ppm) and a control were selected for the test.

D. **Design:** Ten fish were randomly introduced, one at a time, into each of the test containers. The fish were observed daily for mortality and signs of intoxication. Water temperature and dissolved oxygen (D.O.) were determined daily, and the pH measured at the beginning and end of the test. Hardness and alkalinity were determined at the beginning of the test.

E. **Statistics:** The median lethal concentration (LC_{50}) and associated 95% confidence interval (C.I.) for each 24-hour interval were calculated using the method of Weil (1952).

12. **REPORTED RESULTS:** The 96-hour LC_{50} value for Bayleton 50% Wettable Powder based on nominal concentrations was 24 ppm (Table I, attached). The no-observed-effect concentration (NOEC) after 96 hours, determined by the lack of observed intoxication, was 15 ppm.

Test solution pH and D.O. were reported as 7.4-8.1 and 5.4-8.6 mg/L, respectively. Raw data of environmental conditions monitored during the test were not provided.

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

No conclusions were made by the author.

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. An exception to section 160.113 was made by the author; the mixture of the test substance with the carrier was not analyzed for homogeneity, stability or concentration of the test substance.

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

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

The hardness of the dilution water, 170 mg/L as $CaCO_3$, was much greater than the recommended hardness (40-48 mg/L).

Inert ingredients present in the formulation were not tested separately.

Loading during the test (1.39 g/L) was much greater than recommended (0.5 g/L).

Filtered dechlorinated water was probably used as test dilution water. The water source appears to be a small water purification facility. Filtration through resin and activated carbon, as described in the report, indicates the presence of chlorine in the water supply.

Full descriptions of the test system and methodology were not included in the report. There was no information on the age, average length, length range, year class, and pretest mortality of the fish used in the toxicity test. No information on test parameters like average temperature, test solution and vessel depth, vessel construction material and dimensions, the temperature maintenance system, dilution water quality, and the length of the transition period between light and dark was provided.

The fish acclimation period (reported as being greater than 5 days) was less than the recommended two weeks.

Test fish average weight was 6.96 g; recommended weight is between 0.5 and 5.0 g.

One test chamber out of the six contained less than 10 organisms.

Test chamber temperature was not recorded continuously.

The recommended test temperature for warmwater fish is 17°C or 22°C; temperature in this test was 18-20°C.

B. **Statistical Analysis:** The reviewer used EPA's Toxanal program to calculate the LC_{50} values and obtained comparable results (see attached printout).

C. **Discussion/Results:** No mortality occurred in the control, therefore, the use of dechlorinated water, the short acclimation period and excessive loading probably did not significantly affect the results. The fish were larger than recommended, but were probably still juveniles or young adults (Trautman, 1981).

Several points weaken this study. The author did not report whether there were any observations on the solubility and presence of precipitates in the test solutions as noted in a study by ABC Laboratories (MRID No. 147865, Daphnia magna) using the same formulation. High dilution water hardness is known to affect chemical toxicity. The difference between recommended and actual test hardness is significant and may have modified the LC_{50} produced in the test. Additional testing would be helpful in determining if the toxicity of Bayleton 50% Wettable Powder is modified by water hardness. Also, if the formulation contains a surfactant, the surfactant may not be as effective in hard water as would be expected in soft water. Hence, a runoff event caused by rain would be expected to increase the availability of the product and potentially the toxicity. Finally, much of the information necessary to adequately describe the materials and methodology used to perform the test was not included in the report.

The study appears to be scientifically valid but deviations from the SEP indicate additional tests and/or information are necessary to validate the LC_{50} values estimated. The 96-hour LC_{50} of 24.7 ppm (based on nominal concentrations) classifies Bayleton 50% Wettable Powder as slightly toxic to the bluegill sunfish. The NOEC was estimated to be 15 ppm after 96 hours.

D. **Adequacy of the Study:**

(1) **Classification:** Supplemental

(2) **Rationale:** a) The materials and methods were not fully described. b) Raw data of water quality measured during the test were not provided. c) The hardness of the dilution water was much greater than the recommended range.

(3) **Repairability:** Yes, if the registrant can provide the above missing information and evidence showing that the variation in water hardness does not modify the toxicity of Bayleton 50% Wettable Powder to bluegill sunfish.

15. **COMPLETION OF ONE-LINER FOR STUDY:** Yes, 01-11-91.

16. **REFERENCES:**

Trautman, M.B. 1981. The Fishes of Ohio. Ohio State University Press, pp. 580-582.