

US EPA ARCHIVE DOCUMENT

DATA EVALUATION RECORD

- 1. **CHEMICAL:** Triadimefon
Shaughnessey No.: 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: Rainbow Trout (Salmo gairdneri)
- 4. **CITATION:** Carlisle, J.C. 1984. Acute Toxicity of ®BAYLETON 50% Wettable Powder to Rainbow Trout (Salmo gairdneri). Study No. 84-066-10. Prepared by Environmental Health Research, Mobay Chemical Corporation, Stilwell, KS. Submitted by Mobay Chemical Corporation, Stilwell, KS. EPA MRID No. 147864 or 460087005
- 5. **REVIEWED BY:**
Dennis J. McLane, Wildlife Biologist Signature: *D. McLane*
Section 1, Ecological Effects Branch Date: 4-6-93
Environmental Fate and Effects Division
- 6. **APPROVED BY:**
Les Touart, Chief, Section 1 Signature: *LT*
Ecological Effects Branch Date: 4-15-93
Environmental Fate and Effects Division
- 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 LC₅₀ of Bayleton 50% Wettable Powder to rainbow trout was 22.9 ppm. This value classifies Bayleton 50% Wettable Powder as slightly toxic to rainbow trout. The NOEC was estimated as 6.7 ppm. The study report does not fully describe the materials and methods, reports a dissolved oxygen below 40% saturation, and the test used dilution water with much greater hardness than the recommended range.
- 8. **RECOMMENDATIONS:** See Section 14.D.(3).
- 9. **BACKGROUND:**

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5. **REVIEWED BY:**

Louis M. Rifici, M.S. Associate Scientist II KBN Engineering and Applied Sciences, Inc.	Signature: <i>Louis M Rifici</i> Date: <i>1/23/91</i>
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6. **APPROVED BY:**

Pim Kosalwat, Ph.D. Senior Scientist KBN Engineering and Applied Sciences, Inc.	Signature: <i>P. Kosalwat</i> Date: <i>1/23/91</i>
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 LC₅₀ of Bayleton 50% Wettable Powder to rainbow trout was 22.9 ppm. This value classifies Bayleton 50% Wettable Powder as slightly toxic to rainbow trout. The NOEC was estimated as 6.7 ppm. The study report does not fully describe the materials and methods, reports a dissolved oxygen below 40% saturation, and the test used dilution

10. DISCUSSION OF INDIVIDUAL TESTS: N/A**11. MATERIALS AND METHODS:**

- A. **Test Animals:** Rainbow Trout (*Salmo gairdneri*) used in this test were hatched from eggs obtained from a commercial supplier in California and acclimated to test water and temperature for at least 5 days. Fish were fed Ralston Purina Trout Chow. Mean body weight was 0.52 grams at test commencement.
- B. **Test System:** Weighed quantities of Bayleton 50% Wettable Powder were mixed with 15 liters of filtered (carboxylic acid resin and activated carbon) Johnson County municipal tap water in 19-liter glass jars. The temperature ranged from 12.1 to 14.2°C. The photoperiod during the test was 16-hours light daily. The fish were not fed during the test.
- C. **Dosage:** Ninety-six-hour static test. Seven nominal concentrations (6.7, 10, 15, 22.5, 33.8, 50.6 and 75.9 mg/L) and two water control jars 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 (LC₅₀) 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 LC₅₀ for Bayleton 50% Wettable Powder based on nominal concentrations was 24 mg/L (Table I, attached). The no-observed-effect concentration (NOEC) after 96 hours, determined by the lack of observed intoxication, was 6.7 mg/L.

Test solution pH and D.O. were reported as 7.14-8.12 and 3.4-9.2 mg/L, respectively. Hardness and alkalinity were 177-198 mg/L as CaCO₃ and 72-81 mg/L as CaCO₃, respectively. Raw data of environmental conditions 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, 177-198 mg/L as CaCO₃, was much greater than the recommended hardness (40-48 mg/L).

Inert ingredients present in the formulation were not tested separately from the active ingredient. Therefore, the contribution of the inert ingredients to the toxicity of the test material is unknown.

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.

The D.O. in the test ranged from 3.4 to 9.2 mg/L. Given a test temperature of 12°C (and corresponding oxygen saturation of 10.8 mg/L at sea level), these values represent the percent oxygen saturation ranging from 32 to 85%. Excursions below 40% saturation are not recommended in the SEP. Since raw data were not provided in the report, the test vessel(s) experiencing D.O. sags below 40% saturation is/are not known. Low D.O. may not be responsible for increased mortality in unstressed fish, but may synergistically increase mortality in toxicant stressed populations.

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, dilution water quality, the temperature maintenance system, and 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 chamber temperature was not recorded continuously.

The recommended test temperature for coldwater fish is 12°C and should not vary more than 1°C during the entire study period. The reported temperature ranged from 12.1 to 14.2°C.

- B. **Statistical Analysis:** The reviewer used EPA's Toxanal program to calculate the LC₅₀ values and obtained comparable results (see attached printout).
- C. **Discussion/Results:** No mortality occurred in the control, therefore, the use of dechlorinated water and the short acclimation period probably did not significantly affect the results.

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. Knowledge of the quantity of test material in solution, either by direct measurement or inferred by the solubility, is essential to the classifying the study as "core".

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 LC₅₀ 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.

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 LC₅₀ values estimated. The 96-hour LC₅₀ of 22.9 mg/L (based on nominal concentrations) classifies Bayleton 50% Wettable Powder as slightly toxic to the rainbow trout. The slope of the probit line was 7.6. The NOEC was estimated to be 6.7 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 dissolved oxygen in one or more containers fell below 40% saturation. d) 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 low dissolved oxygen and the variation in water hardness do not modify the toxicity of Bayleton 50% Wettable Powder to rainbow trout.

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