

US EPA ARCHIVE DOCUMENT

DATA EVALUATION RECORD

12/2/1993

1. **CHEMICAL:** Oxyfluorfen.
Shaughnessey No. 111601.
2. **TEST MATERIAL:** RH-2915; Lot No. 7141; TD No. 85-259; 71.8% active ingredient; a brown solid.
3. **STUDY TYPE:** Freshwater Invertebrate Life-Cycle Test.
Species Tested: Daphnia magna.
4. **CITATION:** Forbis, A.D., C. Land, and B.B. Franklin. 1986. *72-4(b) Aquatic Invent. Life Cycle*
Chronic Toxicity of RH-2915 to Daphnia magna Under Flow-Through Test Conditions. ABC Report No. 33943. Study conducted by Analytical Bio-Chemistry Laboratories, Inc. Columbia, MO. Submitted by Rohm and Haas Company, Spring House, PA. EPA MRID No. 92136106.
5. **REVIEWED BY:**
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Date: 5/16/91
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5/20/92
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Date: 12/2/93
7. **CONCLUSIONS:** This study appears to be scientifically sound but it does not fulfill the guideline requirements for a daphnid life-cycle test. Raw data (biological, physical, and chemical) were not submitted with the report for the evaluation. According to the author's report, the MATC of RH-2915 for Daphnia magna was between 13 µg a.i./L and 28 µg a.i./L mean measured concentrations.
8. **RECOMMENDATIONS:** The registrant should submit all applicable raw data for validation.

10 hrs

9. BACKGROUND:

10. DISCUSSION OF INDIVIDUAL TESTS: N/A.

11. MATERIALS AND METHODS:

A. Test Animals: Daphnia magna (<24 hours old) were obtained from populations cultured at the testing facility. The cultures were maintained in a temperature controlled area at $20 \pm 2^\circ\text{C}$. The daphnids were fed a combination of green alga (Selenastrum capricornutum) and supplemented with a Tetramin[®]-cerophyl suspension.

B. Test System: The flow-through test system was a 500-ml proportional diluter apparatus. Test vessels were 1-L beakers. Each beaker drained through a notched drain covered with a stainless steel 50-mesh screen.

The diluter delivered five nominal concentrations of test material, a solvent control, and a dilution water control to quadruplicate test vessels. The diluter delivered water to each vessel at a rate of 125 ml/chamber/55 minutes which provided 3.3 volume replacements every 24 hours.

The diluent, which was aerated, aged ABC well water, had total hardness and alkalinity ranges of 225-275 and 325-375 mg/L as CaCO_3 , respectively; a pH range of 7.8-8.3; and the specific conductivity was 700 $\mu\text{mhos/cm}$.

Sixteen hours of light at an intensity of 50-70 footcandles with 30 minute dawn and dusk transition periods. Test temperature was maintained at $20 \pm 1^\circ\text{C}$ by a temperature controlled water bath.

C. Dosage: Twenty-one-day, life-cycle, flow-through test. Nominal test concentrations selected based on results of range-finding studies were 3.7, 6.0, 14, 24, and 50 $\mu\text{g a.i./L}$.

D. Design: Four replicates of five RH-2915 concentrations, solvent control, and dilution water control were included in the test. Ten daphnids (<24 hours old) were randomly assigned and distributed to each exposure vessel (i.e., 40 daphnids/concentration).

The daphnids were fed an equal amount per test vessel of Selenastrum capricornutum three times daily and

Tetramin®-cerophyl suspension once daily. The test vessels were brushed and the solutions filtered through fine-mesh nets three times weekly.

Adult survival and reproduction was determined every Monday, Wednesday, and Friday during the test period. At test termination, total body length of all surviving adults was recorded.

Dissolved oxygen concentration (DO) and pH were measured on days 0, 4, 7, 14, and 21 in the high, medium and low test concentrations and the control. Temperature was monitored both continuously and daily in the water bath.

Composite water samples were collected from each replicate vessel of all groups on test days 0, 4, 7, 14, and 21 for determination of RH-2915 concentrations.

- E. Statistics:** "The chronic life cycle study was a randomized complete block design. The measured parameter of surviving adult length in the quadruplicate test chambers was analyzed using a two-way analysis of variance with an interaction model to determine whether any interaction was present between the two factors (concentration and block)..If the analysis indicated no significant block effect, quadruplicate data were pooled."

"The selected parameters of adult length (pooled), survival and total young/adult/reproduction day were analyzed using a completely randomized design and subjected to a one-way analysis of variance. Control and solvent control parameters were analyzed initially and if no difference was indicated, the controls were pooled before compared to treatments. When treatment effects were indicated following a significant F-test of the mean square ratios, a multiple means comparison test, Fisher's protected Least Significant Difference test (LSD), was used to determine which exposure levels differed from the control values. If control and solvent control were statistically different, then treatments would be compared against solvent control."

12. **REPORTED RESULTS:** Results of preliminary tests were presented in the report.

Results of GLC analyses indicated mean measured concentrations were 1.8, 4.3, 7.4, 13, and 28 µg/L (Table 3, attached).

"The two-way analysis of variance, used to analyze the lengths of the surviving adults, failed to identify any significant block effects. Therefore, the replicate data were pooled and analyzed using a one-way analysis of variance. This analysis indicated that the daphnid lengths in the RH-2915 mean measured concentration of 28 $\mu\text{g/L}$ were significantly different from the pooled controls (Table 5, attached)."

"Statistical analysis of survival for Daphnia magma after a 21-day exposure to RH-2915 indicated that daphnid survival in all the mean measured test concentrations were not significantly different ($\alpha = 0.05$) from the pooled controls (Table 5, attached). It should be noted that the survival of the 28 $\mu\text{g/L}$ test concentration was 17% lower than the control, but was not identified as statistically different. However, the decrease in survival would appear to be compound related."

"The mean young/adult/reproduction day after 21 days was significantly affected in the mean measured exposure level of 28 $\mu\text{g/l}$ of RH-2915 (Table 5, attached). No young were observed until 7 days into the study."

Water quality parameters are presented in Table 6 (attached).

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

"Based on the statistical analysis of adult mean length, survival and young/adult/reproduction day from the 21-day Daphnia magma dynamic life cycle study, the MATC limits are estimated to be the RH-2915 mean measured concentrations of 13 and 28 $\mu\text{g/L}$. The 13 $\mu\text{g/L}$ test concentration represents the no-effect level (NOEL) for RH-2915 during the study based on measured parameters. The 28 $\mu\text{g/l}$ test concentration was the lowest test concentration which produced an effect on adult mean length, survival and/or young/adult/reproduction day."

A GLP compliance statement was included in the report indicating that the data and report prepared for this study were produced and compiled in accordance with EPA Good Laboratory Practice Standards. This statement was signed by the Study Director.

A Quality Assurance Statement was included and signed by a representative of the Quality Assurance Unit of the performing laboratory.

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

- A. Test Procedure:** An SEP for Daphnia chronic flow-through studies is not available at this time, thus ASTM recommended procedures were used in this data validation process. The test procedure was in accordance with ASTM, except for the following deviations:

The dry weight of first-generation daphnids was not determined. ASTM prefers dry weight to length for growth measurement.

Not all concentrations were 50% of the next concentration. ASTM recommends that each concentration is at least 50% of the next higher concentration.

The test material was not delivered within $\pm 30\%$ the nominal concentration during the test study, as recommended by ASTM guidelines.

ASTM recommends 2 liter test vessels holding 1.5 L of test solution. The report indicates 1 L vessels were used, containing 1 L test solution.

Hardness and alkalinity measurements were not measured weekly. ASTM recommends weekly monitoring of these parameters in the high, medium and low test concentrations.

ASTM recommends a 4 to 6 volume exchange per day. The report stated 3.3 volume exchange per day.

The author did not describe the solvent concentration used in the solvent control. The solvent control should not contain greater than 0.1 mL solvent/L.

The author did not indicate the selection criteria (i.e., brood number) for organisms used in the test.

- B. Statistical Analysis:** Since raw data were not submitted with the report, statistical analyses could not be verified.
- C. Discussion/Results:** Raw data were not submitted by the registrant. All raw data for each biological endpoint and for physical and chemical parameters measured during the test must always be submitted.

According to the author's report, the MATC of RH-2915 for Daphnia magna was between 13 and 28 $\mu\text{g/L}$ mean measured concentrations, based on growth and reproduction effects.

D. Adequacy of the Study:

- (1) **Classification:** Supplemental.
- (2) **Rationale:** 1) Raw data (biological, physical, and chemical) were not submitted with the report.
2) Statistical analyses could not be verified due to the lack of raw data.
- (3) **Repairability:** Pending the reviewer's evaluation of the above raw data.

15. **COMPLETION OF ONE-LINER:** Yes, April 26, 1991.

RIN 0637-00

EFED Review - Oxyfluorfen

Page is not included in this copy.

Pages 7 through 9 are not included.

The material not included contains the following type of information:

- Identity of product inert ingredients.
- Identity of product impurities.
- Description of the product manufacturing process.
- Description of quality control procedures.
- Identity of the source of product ingredients.
- Sales or other commercial/financial information.
- A draft product label.
- The product confidential statement of formula.
- Information about a pending registration action.
- FIFRA registration data.
- The document is a duplicate of page(s) .
- The document is not responsive to the request.

The information not included is generally considered confidential by product registrants. If you have any questions, please contact the individual who prepared the response to your request.

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Shaugnessy # ~~028201~~ 028201 Chemical Name Dry Fluorfen Chemical Class _____ Page 1 of 1

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

Chronic Fish _____ Concentrations Tested (pp) - _____

Species: _____ MATC - > _____ < _____ pp. _____

Lab: _____ Effected Parameters - _____

MRID # _____ Control Mortality (%) - _____ Solvent Control Mortality (%) - _____

Comments: _____

Chronic Invertebrate 71.8% Concentrations Tested (ppb) - 1.8, 4.3, 7.4, 13, 28

Species: _____ MATC - > 28 < 13 ppb. _____

Lab: Daphnia magna Effected Parameters - reproduction, growth

ABC (Leaph) _____

MRID # _____ Control Mortality (%) - 8 Solvent Control Mortality (%) - 8

Comments: Based on mean measured concentrations.

Author's MATC values.

No raw data presented with report.

Q2136106

RCM
4/24/91 Supplemental

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