

US EPA ARCHIVE DOCUMENT

## DATA EVALUATION RECORD

12/2/1993

1. **CHEMICAL:** Oxyfluorfen.  
Shaughnessey number: 111601.
2. **TEST MATERIAL:** RH 2915 technical; Lot # 7364; 74% active ingredient; a solid.
3. **STUDY TYPE:** Shrimp 96-Hour Acute Toxicity Test. Species tested: Grass shrimp (Palaemonetes pugio).  
72-3(c) Acute Est. / Marine Shrimp
4. **CITATION:** Vilkas, A.G. 1977. Acute Toxicity of RH 2915 Technical, Lot #7364 (74% Active Ingredient) To The Grass Shrimp, Palaemonetes pugio. UCES Project Number: 11506-33-02. Prepared by Union Carbide Environmental Services, Union Carbide Corporation, Tarrytown, New York. Submitted by Rohm and Haas Company, Research Laboratories, Spring House, Pennsylvania. EPA MRID Number 3097011-07.
5. **REVIEWED BY:**  
Jeffrey V. Wheat  
Aquatic Toxicologist  
Toxikon Environmental Sciences  
Signature: *JVW*  
Date: 4/19/91
6. **APPROVED BY:**  
Pim Kosalwat, Ph.D.  
Senior Toxicologist  
KBN Engineering and  
Applied Sciences, Inc.  
Signature: P. Kosalwat  
Date: 5/24/91  
Henry T. Craven, M.S.  
Supervisor, EEB/HED  
USEPA  
*John Niles*  
*5/20/92*  
Signature: *Henry T. Craven*  
Date: 12/2/93
7. **CONCLUSIONS:** This study appears to be scientifically valid, but does not fulfill guideline requirements for a shrimp 96-hour acute toxicity test. Based upon nominal concentrations of RH 2915 technical, the 96-hour LC<sub>50</sub> for grass shrimp (Palaemonetes pugio) was 32 µg/L which classifies this compound as "very highly toxic". The no-observed-effect concentration (NOEC) was determined to be 18 µg/L.
8. **RECOMMENDATIONS:** N/A.

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

- A. Test Animals:** Grass shrimp (*Palaemonetes pugio*) used in this test were obtained from a commercial supplier in Florida. The shrimp were acclimated in artificial seawater with a salinity of 30 ‰ for 14 days prior to testing. Shrimp had a mean weight and length of 0.33 grams and 2.75 cm, respectively. Biological loading was 0.22 g/L. Shrimp were not fed 48 hours prior to test initiation. No other acclimation details were provided.
- B. Test System:** The test was conducted in 18.9-liter (L) glass jars containing 15 L of artificial seawater. Dilution water was prepared with deionized, reverse osmosis well water raised to a salinity of 28 ‰ according to the method of Zarogian et al. (1969). Zero-hour measured control water parameters of this dilution water had a dissolved oxygen (DO) concentration of 8.2 mg/L and a pH of 7.97. The test was conducted in a temperature controlled water bath which maintained temperature at 18 ±1°C.
- C. Dosage:** Ninety-six-hour static test. Five nominal concentrations of the test substance were tested: 10, 18, 32, 56, and 100 µg/L. A solvent control of acetone was maintained at a concentration which was equal to the amount present in the highest test concentration. All treatments containing test compound were dosed prior to animal addition.
- D. Design:** Five concentrations, a solvent control, and a control were selected for the study. Treatments were not replicated. Ten shrimp were distributed to each treatment. All organisms were observed at 24, 48, 72, and 96 hours for mortality and abnormal effects. The DO and pH were measured in both controls and the low, middle, and high test concentrations at 0, 48, and 96 hours. Salinity was measured in the dilution water at test initiation. No confirmation of test concentrations was performed.
- E. Statistics:** The 24-, 48-, and 96-hour LC<sub>50</sub> values and their associated 95% confidence limits were reported; however, the method used was not described.

12. **REPORTED RESULTS:** Results of the 96-hour static toxicity test with the grass shrimp (*Palaemonetes pugio*) exposed to RH 2915 technical are presented in Table 1 (attached).

The reported 24-, 48-, and 96-hour LC<sub>50</sub>'s, based upon nominal concentrations, were >100, >100, and 31.7 µg/L, respectively. The NOEC was reported to be 18.0 µg/L. During the course of the study, DO concentration ranged from 3.0 mg/L to 8.7 mg/L (38% - 112% of saturation). The pH ranged from 7.02 to 7.97. Temperature in the water bath ranged from 17.8 to 18.3°C.

13. **STUDY AUTHOR'S CONCLUSIONS/QUALITY ASSURANCE MEASURES:**  
No conclusions were made by the authors.

A GLP compliance statement was not included in the report and no indication was given that the study was audited by a quality assurance unit.

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

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

- o The SEP recommends a salinity range of 10 to 17 ‰ for estuarine species of which the grass shrimp is a member. Salinity for this study was 28 ‰.
- o The solvent concentration used in the test was not stated.
- o The SEP states that each designated treatment group should be exposed to a concentration of toxicant that is at least 60% of the next highest concentration. Each designated treatment group for this test was only 56% of the next highest concentration.
- o The SEP advocates the use of a 16-hour light : 8-hour dark photoperiod with a 15- to 30-minute transition period between light and dark cycles of the photoperiod. The report does not state whether any photoperiod was maintained.
- o A temperature of 22°C is recommended by the SEP. The temperature in this test was 18 ±1°C.

- o No information was provided on a preliminary study, if one was conducted.
- o It was not clearly stated in the report if the test concentrations were reported as active ingredient or whole material.
- o The SEP states that the test organisms must be randomly distributed to the test containers within 30 minutes of the addition of the test material. The report does not state the method of distribution or the time frame.
- o The SEP states that the temperature must be measured every 6 hours if the test is conducted in a water bath. The temperature was measured at 24, 48, and 96 hours.
- o The SEP states that the DO concentration should not fall below 40% during the period between 48 and 96 hours of the study. The DO concentration was reported to be 38% in the high concentration at 96 hours.

B. **Statistical Analysis:** The reviewer used the EPA's Toxanal computer program to calculate the 96-hour  $LC_{50}$ . The results were calculated by the binomial method (attached).

C. **Discussion/Results:** The study results appear to be scientifically valid. The 96-hour  $LC_{50}$  based upon nominal concentrations of RH 2915 technical was 32  $\mu\text{g/L}$  with 95% confidence limits of 18 and 56  $\mu\text{g/L}$  nominal concentrations. The NOEC was 18  $\mu\text{g/L}$ .

D. **Adequacy of the Study:**

(1) **Classification:** Supplemental.

(2) **Rationale:** The test procedures deviated from the guidelines as described in Section 14A, however, the reviewer believes that the information provided would be useful in a risk assessment.

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

15. **COMPLETION OF ONE-LINER:** Yes, April 19, 1991.

**AUTHOR REFERENCES:**

Zarogian, G. E., G. Pesch and G. Morrison. 1969.  
Formulation of an artificial sea water media  
suitable for oyster larvae development. American  
Zoologist 9(4):144.

RIN 0637-00

EFED Review - Oxyfluorfen

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The material not included contains the following type of information:

- Identity of product inert ingredients.
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- Description of the product manufacturing process.
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- FIFRA registration data.
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CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB. (PERCENT)
100	10	10	100	9.765625E-02
56	10	10	100	9.765625E-02
32	10	5	50	62.30469
18	10	0	0	9.765625E-02
10	10	0	0	9.765625E-02

THE BINOMIAL TEST SHOWS THAT 18 AND 56 CAN BE USED AS STATISTICALLY SOUND CONSERVATIVE 95 PERCENT CONFIDENCE LIMITS, BECAUSE THE ACTUAL CONFIDENCE LEVEL ASSOCIATED WITH THESE LIMITS IS GREATER THAN 95 PERCENT.

AN APPROXIMATE LC50 FOR THIS SET OF DATA IS 32

WHEN THERE ARE LESS THAN TWO CONCENTRATIONS AT WHICH THE PERCENT DEAD IS BETWEEN 0 AND 100, NEITHER THE MOVING AVERAGE NOR THE PROBIT METHOD CAN GIVE ANY STATISTICALLY SOUND RESULTS.

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ONE LINER

Shaughnessey Number 111601	Chemical Name Oxyflourfen	Chemical Class 748	Chemical & A.I. 309711-07	Accession Number
Study Type : 96-Hour	95% Confid. Limits			
Test Species: Palaemonetes pugio	LC50 = 32 PP B ( 18 to 56 )			
Lab: Union Carbide Envir. Services	Slope = N/C # Animals/Level = 10			
Control Mortality: 0 %	Dose Level PP B / (% Mortality)			
Test Temperature: 180 C	10 ( 0 )	18 ( 0 )	32 ( 0 )	56 ( 50 ) 100 ( 100 ) ( )
Comments: Concentrations based upon <del>mean</del> <u>nominal</u> / measured concentrations. (Circle one)				
Reviewer: Jeff Wheat	Date: April 19, 1991	Validation Status: Supplemental		
Study Types : 48-Hour LC50 96-hour LC50	Comments should indicated whether test concentrations were based upon Nominal or Measured concentrations.			
Validation Status codes to be used above: CORE, SUPPLEMENTAL, INVALID.				
Accession Number = MRID Number.				

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