12/24/90 Ignite Technology 128850

MRID No. 413961-04

DATA EVALUATION RECORD

1. **CHEMICAL:** Glufosinate.
Shaughnessey Number: 128850.

2. **TEST MATERIAL:** HOE 039866 Technical (HOE 039866 OH ZC96 0002); 96.3% active ingredient; a white powder.

3. **STUDY TYPE:** Estuarine fish static acute toxicity test.
Species Tested: Sheepshead minnow (Cyprinodon variegatus).

4. **CITATION:** Swigert, J.P. 1986. Acute Toxicity of Hoe 039866 Technical Substance (Code: Hoe 039866 OH ZC96 0002) to the Sheepshead Minnow (Cyprinodon variegatus). Prepared by Analytical Bio-Chemistry Laboratories, Inc., Columbia, Missouri. ABC Study #34154. Report #A33264. Submitted by Hoechst Celanese Corporation, Somerville, New Jersey. MRID No. 413961-04.

5. **REVIEWED BY:**

Kimberly Rhodes
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Signature: Kimberly Rhodes
Date: July 19, 1990

6. **APPROVED BY:**

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Signature: P. Kosalwat
Date: 7/19/90

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

Signature: R.C. Petrie
Date: 12/20/90

M Rhodes 12/24/9

7. **CONCLUSIONS:** This study appears scientifically sound and fulfills the guideline requirements for a 96-hour static acute toxicity study using estuarine fish. The 96-hour LC50 value, based upon nominal HOE 039866 concentrations, was determined to be >1000 mg/L. Therefore, HOE 039866 is classified as practically non-toxic to sheepshead minnows (Cyprinodon variegatus). The NOEC was determined to be >1000 mg/L after 96 hours of exposure.

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

6 hrs

1

9. **BACKGROUND:**

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

11. **MATERIALS AND METHODS:**

A. **Test Animals:** Sheepshead minnows (Cyprinodon variegatus) used in this test were obtained from a commercial fish supplier in New York. The fish were held in culture tanks on a 16-hour daylight photoperiod for 38 days prior to test initiation. During the holding period, the fish received a mixed diet of brine shrimp nauplii (Artemia sp.) and Tetramin® fish food daily until 72 hours prior to testing. The test fish were also acclimated to the dilution water and test temperature. The control sheepshead minnows used for this experiment measured at test termination had a mean weight of 0.52 (± 0.22) grams (g) and a mean standard length of 25 (± 2.6) millimeters (mm). This gave a test chamber loading biomass of 0.17 g/L for the definitive study.

B. **Test System:** The test was conducted in five gallon glass vessels containing 15 liters of test solution. The test vessels were kept in a water bath at 22 (± 2) °C.

The dilution water used for this study was reconstituted saltwater composed of Marinemix®, Bio-Elements and deionized water. The water was prepared to have an initial salinity of 25 parts per thousand (ppt). At test initiation, the dilution water control was characterized as having a dissolved oxygen concentration of 7.7 mg/L and a pH of 8.5.

C. **Dosage:** 96-hour static acute test. The nominal test concentrations were 100, 180, 320, 560, and 1000 mg/L.

D. **Design:** Based on the results of a range-finding test, a control and five nominal Hoe 039866 concentrations were chosen for testing. All test concentrations were based on the total compound and were not corrected for sample purity. The control and each test concentration were conducted in duplicate with five fish per replicate concentration. The fish were added to the test chambers by random assignment within 30-minutes after addition of test material. All test organisms

were observed once every 24 hours for mortality and abnormal (sub-lethal) effects.

Water quality parameters (dissolved oxygen concentration, temperature, pH, and salinity) were measured at 0, 48, and 96 hours of the study in the control, low (100 mg/L), middle (320 mg/L), and high (1000 mg/L) concentrations. The temperature of the water bath was also continuously monitored during the exposure.

E. **Statistics:** Statistical analysis was not needed since no mortality occurred during the study.

12. **REPORTED RESULTS:** The results of the 96-hour static toxicity test with sheepshead minnows (Cyprinodon variegatus) exposed to HOE 039866 are presented in Table 4 (attached). The 24-, 48-, 72-, and 96-hour LC50 values for HOE 039866 were all >1000 mg/L nominal concentration. The 96-hour no-observed-effect concentration (NOEC) was determined to be >1000 mg/L, the highest nominal concentration tested. Abnormal effects (i.e., fish on the bottom of test chamber and loss of equilibrium) were observed in the 100 mg/L. This abnormal effect was not believed to be toxicant related.

During the study, the dissolved oxygen concentrations, corrected for salinity ranged from 4.8 to 7.7 mg/L (65% to 104% saturation at 23°C, respectively); pH ranged from 7.5 to 8.5; temperature ranged from 23 to 24°C; and salinity was 25 ppt.

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

The study was conducted following the intent of the Good Laboratory Practice Regulations and the final report was reviewed by Analytical Bio-Chemistry Laboratories' Quality Assurance Unit.

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

A. **Test Procedure:** The test procedures were generally in accordance with protocols recommended by the SEP except for the following deviations:

o The SEP states that individual fish should weigh between 0.5 and 5 grams. The fish used in this study weighed between 0.267 and 1.081 grams.

o The SEP states that natural or reconstituted seawater of 10 to 17 ppt salinity should be used when testing euryhaline fish species. The reconstituted saltwater used during this toxicity study had a salinity of 25 ppt.

o The SEP recommends a 16-hour light and an 8-hour dark photoperiod with a 15- to 30-minute transition period between light and dark. The report did not state whether a 15- to 30-minute transition period between light and dark was maintained.

B. **Statistical Analysis:** Statistical analysis was not needed since no mortality occurred during the study.

C. **Discussion/Results:** This study appears to be scientifically valid. The 96-hour LC50 value, based upon nominal concentrations, was determined to be >1000 mg/L. Therefore, HOE 039866 Technical Substance is considered practically non-toxic to sheepshead minnow (Cyprinodon variegatus). The NOEC was determined to be >1000 mg/L, the highest concentration tested.

D. **Adequacy of the Study:**

(1) **Classification:** Core.

(2) **Rationale:** Although the test procedures deviated from the guidelines, the deviations did not significantly affect the results.

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

15. **COMPLETION OF ONE-LINER:** Yes, 07-10-90.

Shaughnessey No. 128850 Chemical Name Glufosinate Chemical Class ____ Page ____ of ____

(HOE 039866 Technical Substance)

Study/Species/Lab/Accession	Chemical % a.i.	Results	Reviewer/Date	Validation Status
14-Day Single Dose Oral LD_{50}		LD50 = mg/kg (95% C.L.) Contr. Mort.(%)=		
Species ____		Slope= # Animals/Level= Age(Days)= Sex =		
Lab		14-Day Dose Level mg/kg/(% Mortality) ( ), ( ), ( ), ( ), ( )		
Acc.		Comments:		
14-Day Single Dose Oral LD_{50}		LD50 = mg/kg. (95% C.L.) Contr. Mort.(%)=		
Species ____		Slope= # Animals/Level= Age(Days)= Sex =		
Lab		14-Day Dose Level mg/kg/(% Mortality) ( ), ( ), ( ), ( ), ( )		
Acc.		Comments:		
8-Day Dietary LC_{50}		LC50 = ppm (95% C.L.) Contr. Mort.(%)=		
Species		Slope= # Animals/Level= Age(Days)= Sex =		
Lab ____		8-Day Dose Level ppm/(%Mortality) ( ), ( ), ( ), ( ), ( )		
Acc.		Comments:		
8-Day Dietary LC_{50}		LC50 = ppm (95% C.L.) Contr. Mort.(%)=		
Species		Slope= # Animals/Level= Age(Days)= Sex =		
Lab ____		8-Day Dose Level ppm/(%Mortality) ( ), ( ), ( ), ( ), ( )		
Acc.		Comments:		
48-Hour LC_{50}		LC50 = pp__ (95% C.L.) Contr. Mort.(%)= Sol. Contr. Mort.(%)=		
Species		Slope= # Animals/Level= Temperature =		
Lab ____		48-Hour Dose Level pp /(%Mortality) ( ), ( ), ( ), ( ), ( )		
Acc.		Comments:		
96-Hour LC_{50}		LC50 = >1000 ppm (95% C.L. N/A) Con. Mor(%)= 0 Sol. Con. Mor.(%)= N/A	H.R. 7/10/90	Core
Species Cyprinodon variegatus		Slope= N/A # Animals/Level= 10 Temp.= 23-24°C		
Lab Analytical Bio-Chemistry Laboratories, Inc. 96.3%		96-Hour Dose Level ppm/(%Mortality) 100 (0), 180 (0), 320 (0), 560 (0), 1000 (0)		
Acc. MRID # - 413961-04		Comments: Based on nominal concentrations. NOEC = >1000 mg/L.		
96-Hour LC_{50}		LC50 = pp__ (95% C.L.) Con. Mort.(%)= Sol. Con. Mort.(%)=		
Species		Slope= # Animals/Level= Temp.=		
Lab ____		96-Hour Dose Level pp /(%Mortality) ( ), ( ), ( ), ( ), ( )		
Acc.		Comments:		

TABLE 4

Mortality Rates and Water Quality Measurements During the Acute Toxicity Test of HOE 039866 to Sheepshead Minnows (Cyprinodon variegatus)

Nominal Concentration (mg/l)	Percent Mortality Hours			Water Quality [d] 0-hours				48-hours				96-hours			
	24	48	96	Temp. °C	D.O.[a] mg/l	pH[b]	Salinity[c] ppt	Temp. °C	D.O. mg/l	pH	Salinity ppt	Temp. °C	D.O. mg/l	pH	Salinity ppt
Control	0	0	0	23	8.9/7.7	8.5	25	24	7.2/6.3	8.1	25	23	6.6/5.7	7.9	25
100	0	0	0	23	8.9/7.7	8.3	25	24	7.1/6.2	8.0	25	23	6.6/5.7	7.9	25
180	0	0	0												
320	0	0	0	23	8.8/7.6	8.0	25	24	7.4/6.4	8.0	25	23	6.5/5.6	7.7	25
560	0	0	0												
1000	0	0	0	23	8.8/7.6	7.6	25	24	7.0/6.1	7.5	25	23	5.5/4.8	7.5	25

[a]Dissolved oxygen concentrations corrected for salinity and temperature - Dissolved Oxygen Probe (YSI Model 54). Top number represents measured value; Bottom number is measured value corrected for oxygen saturation in sea water.

[b]pH - pH Probe (Corning Model 476182) used with a Corning Model 125 pH and mV meter.

[c]Salinity - YSI Model 33 S-C-T Meter, salinity, conductivity and temperature.

[d]Water quality samples taken from Set A.

NOTE: Dissolved oxygen saturation at salinity of 25 ppt and test temperature of 23°C is 7.4 mg/l and at a test temperature of 24°C is 7.3 mg/l.