Accession No. 408938-05

DATA EVALUATION RECORD

1. **CHEMICAL:** Sulfosate

2. **TEST MATERIAL:** SC-0224 4LC-E; 39.9% a.i.
Lot No. WFK-0501; ~~Sample purity not specified~~

3. **STUDY TYPE:** Static Acute Toxicity Test. Species Tested: Rainbow trout, (Salmo gairdneri)

4. **CITATION:** Bowman, J.H. (1987) Acute Toxicity of SC-0224 4LC-E to Rainbow Trout (Salmo gairdneri), ABC Study No. 35638. Prepared by Analytical Bio-Chemistry Laboratories, Inc., Columbia, Missouri; submitted by Stauffer Chemical Co., Richmond, Calif.; Accession No. 408938-05.

5. **REVIEWED BY:**

Kimberly D. Rhodes
Aquatic Toxicologist
Hunter/ESE

Signature: Kimberly D. Rhodes
Date: 01/09/89

6. **APPROVED BY:**

Prapimpan Kosalwat, Ph.D.
Staff Toxicologist
KBN Engineering and
Applied Sciences, Inc.

Signature: P. Kosalwat
Date: January 11, 1989.

Henry T. Craven
Supervisor, EEB/HED
USEPA

Signature: Henry T. Craven
Date: 1/30/89

7. **CONCLUSIONS:** This study appears scientifically sound, ~~but~~ and would ~~does not~~ fulfill the Guideline requirements for a 96-hour/at. with this formulation. static acute study for a coldwater fish species. The 96-hour LC50 based upon nominal concentrations of SC-0224 4LC-E to rainbow trout (Salmo gairdneri) was 603 mg/L, which classifies it as practically non-toxic to rainbow trout. The NOEC was determined to be 320 mg/L after 96 hours.

8. **RECOMMENDATIONS:** N/A

9. **BACKGROUND:**

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

11. **MATERIALS AND METHODS:**

A. **Test Animals:** Rainbow trout (Salmo gairdneri) used in this test were obtained from a commercial supplier in California and were acclimated to the dilution water and test temperature and held without food for 48-96 hours prior to testing. All test fish were held in culture tanks on a 16-hour daylight photoperiod and observed for at least fourteen days prior to testing. The rainbow trout used for this experiment had a mean weight of 0.82 (±0.23) grams and a mean standard length of 39 (±3.3) millimeters. The chamber loading biomass was 0.55 grams/liter. Fish received a standard commercial fish food occasionally supplemented with brine shrimp nauplii (Artemia sp.) daily until 48-96 hours prior to testing.

B. **Test System:** The test was conducted in five-gallon glass vessels containing 15 L of soft reconstituted water. The reconstituted water was composed of 48 mg $NaHCO_3$, 30 mg $CaSO_4 \cdot 2H_2O$, 30 mg $MgSO_4$, and 2 mg KCL per liter of deionized water. The temperature was maintained by a water bath at 12 ± 1°C. Six concentrations and a control were used to determine the toxicity of SC-0224 4LC-E to rainbow trout.

The water parameters of the dilution water were a total hardness of 42 mg/L as $CaCO_3$, a total alkalinity of 32 mg/L as $CaCO_3$, and an initial pH of 7.5. The 0-hour measured control water parameters of this dilution water were dissolved oxygen 9.8 mg/L and pH 7.2.

C. **Dosage:** 96-hour static acute test.

D. **Design:** A 96-hour range-finding and definitive test were conducted. The range-finding test concentrations were set at 1.0, 10, and 100 mg/L. Based on the results of preliminary testing, six concentrations of the test compound, ranging in a logarithmic series from 56 to 1000 mg/L were tested. Ten fish added per chamber within 30 minutes following preparation of nominal concentrations. Treatments were not duplicated. A control and nominal SC-0224 4LC-E concentrations of 56, 100, 180, 320, 560 and 1000 mg/L were maintained. All concentrations were observed once every 24 hours for mortality and abnormal effects.

E. **Statistics:** The computer program developed by Stephan et al. was used to calculate the LC50 values.

12. **REPORTED RESULTS**: "Nominal test concentrations, mortality rates, and water quality data are presented in Table 3 (attached)." The 24-, 48- and 96-hour LC50 values for nominal concentrations of SC-0224 4LC-E were 750, 750 and 600 mg/L, respectively. The no-effect concentration based on mortality and abnormal effects was 320 mg/L after 96 hours. "Upon dosing and mixing the test solutions, a surface foam was created." The dissolved oxygen concentrations ranged from 5.3 to 9.8 mg/L (49 to 92% saturation at 12 and 13°C, respectively) during the test. "This drop was generally associated with increasing concentrations of the test material."

13. **STUDY AUTHOR'S CONCLUSIONS/QUALITY ASSURANCE MEASURES**: The 96-hour LC50 value for SC-0224 4LC-E based upon nominal concentrations was estimated to be 600 mg/L with a 95 percent confidence interval of 320 to 1000. The NOEC (No- Observed-Effect Concentration) was 320 mg/L after 96-hours.

    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. A Quality Assurance Statement was included and signed by the Quality Assurance Officer.

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 test material was not clearly identified as to exact purity.
        - Six hour temperature measurements were not recorded as required by the SEP for tests conducted in a water bath.
        - 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 the test was only 56% of the next highest concentration.

    B. **Statistical Analysis**: The reviewer used the Toxanal computer program to calculate the LC50 values. These calculations are attached. The binomial test provides a 96-hour LC50 value of 603 mg/L with a 95 percent confidence interval of 320 to 1000 mg/L, which is similar to that reported by the author.

C. **Discussion/Results:** The study results appear to be scientifically valid, however, the lack of test substance purity does not permit final evaluation of the substance's toxicity to rainbow trout. The 96-hour LC50 value based upon nominal concentrations was estimated to be 600 mg/L. Therefore, SC-0224 4LC-E is classified as practically non-toxic to rainbow trout (Salmo gairdneri).

D. **Adequacy of the Study:**

(1) **Classification:** Supplemental Core, for this formulation

(2) **Rationale:** Purity of test substance not provided.

(3) **Repairability:** Yes, submit purity of test substance.

15. **COMPLETION OF ONE-LINER FOR STUDY:** Yes, 01-09-89.

- 39.9% a.i., according to proposed label
- Confidential Statement of Formula also on file with Agency

No. _____ Chemical Name sulfosate (SC0224 ~~Technical~~ Chemical Class practically non-toxic Page ___ of ___

Study/Species/Lab/ Succession	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:		
8-Day Dietary LC_{50}		LC50 = pp__ (95% C.L.) Contr. Mort.(%)= Sol. Contr. Mort.(%)=		
Species		Slope= # Animals/Level= Temperature =		
Lab	____	96-Hour Dose Level pp /(%Mortality) ( ), ( ), ( ), ( ), ( )	____	____
Acc		Comments:		
96-Hour LC_{50}		LC50 = 603 ppm (95% C.L. 320-1000) Con. Mor(%)= 0 Sol. Con. Mor.(%)= N/A		
Species Salmo gairdneri		Slope= not given Animals/Level= 10 Temp.= 12±1°C	1/9/89 K.R.	~~Suppl~~ Core, for 4LC-E formulation (39.9 % a.i)
Lab Analytical Bio Chemistry Laboratories	not specified	96-Hour Dose Level ppm/(%Mortality) 56 (0), 100 (0), 180 (0), 320 (0), 560 (40) 1000 (100)		
Acc. 408937-04		Comments: Based on nominal concentrations		
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:		

4LC-E Formulated product

[illegible] RHODES [illegible]-0224 ~~TECHNICAL~~ SALMO GAIRDNERI 01-04-88

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CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB. (PERCENT)
1000	10	10	100	9.765625E-02
560	10	4	40	37.69531
[illegible]	10	0	0	9.765625E-02
[illegible]	[illegible]	0	0	9.765625E-02
[illegible]	[illegible]	0	0	9.765625E-02
[illegible]	[illegible]	0	0	9.765625E-02

[illegible] BINOMIAL TEST SHOWS THAT [illegible] AND 1000 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.

[illegible] ESTIMATE [illegible] FOR THIS SET OF DATA IS [illegible].7239

[illegible] THAN THE CONCENTRATIONS AT WHICH THE [illegible] BETWEEN 0 AND 100, NEITHER THE MOVING AVERAGE [illegible] METHOD CAN GIVE ANY STATISTICALLY SOUND RESULTS.

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