DATA EVALUATION RECORD PAGE 1 OF

CASE: GS0097 CHLOROTHALONIL

CONT-CAT: 01 GUIDELINES: 72-2

MRID: 138143

Ward, G.; Shuba, P. (1983) Acute Toxicity of T-117-11 to Eastern Oysters (Crassostrea virginica): Report No. BP-83-2-25. (Unpublished study received Jan 10, 1984 under 50534-8; prepared by EG & G Bionomics, submitted by SDS Biotech Corp., Painesville, OH; CDL:072266-A)

REVIEW RESULTS:

VALID X INVALID_____ INCOMPLETE_____

GUIDELINE: SATISFIED X PARTIALLY SATISFIED _____ NOT SATISFIED___

DIRECT RVW TIME = 8 hours START DATE: Dec 2, 87 END DATE: Dec 25, 87

REVIEWED BY: Daniel Rieder

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Data Evaluation Report

1. Chemical: Chlorothalonil - 081901

2. Test Material: Technical Grade, Measured Concentrations

3. Study Type: Mollusk shell deposition study with eastern oyster

4. Study ID: Ward, G.; Shuba, P. (1983) Acute Toxicity of T-117-11 to Eastern Oysters (Crassostrea virginica): Report No. BP-83-2-25 Unpublished study prepared by EG & G Bionomics, submitted by SDS Biotech Corp. Acc No. 072266, MRID# 138143

5. Review By: Daniel Rieder, Wildlife Biologist Daniel Rieder 2-25-88
Ecological Effects Branch
Hazard Evaluation Division

6. Approved By: Norman J. Cook, Head Section 2 Norman J Cook 2-25-88
Ecological Effects Branch
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7. Conclusions: The study is scientifically sound and fulfills guideline requirements for an estuarine mollusk acute shell deposition study under section 72.3. The results show an EC50 of 7.3 ppb with 95% C.L. of 4.9 - 12 ppb (nominal concentration). Based on measured concentrations the reviewer generated EC50 = 3.6 ppb with 95% C.L. of 2.9 to 4.3 ppb.

8. Recommendations: N/A

9. Background: This study was submitted to support registration.

10. Discussion of Individual Studies: N/A

11. Materials and Methods:

The measured test material was reported as chlorothalonil. The test animals were Eastern oysters (Crassostrea virginica) and were approximately 37-65mm long umbo to distal valve edge and weighed 1.1-4.9 grams (wet weight without shells, based on measurements of representative organisms). Mean height and weight were 53mm and 2.6g, respectively.

The test water was unfiltered natural seawater. Neither salinity nor temperature was altered.

The test was a 96-hour flow through exposure conducted in 9 liter glass aquaria containing 7 liters of test solution. Lighting was ambient window light supplemented with fluorscent lights during daylight hours. Salinity was 14-27 parts per thousand. The salintiy dropped rapidly during the study due to heavy rains. Temperature was 14-16°C. Ten oysters were tested per test level. There were 6 test levels (1, 2, 4, 8, 16, and 32 ppb nominal), a control and solvent control (acetone). Water samples were collected daily from each treatment for residue analysis.

The EC50 was calculated using the moving average method. Shell growth of oysters in all treatments were compared to that of the solvent control by Students t-test to determine if the presence of chlorothalonil significantly affected new shell growth.

12. Reported Results

Concentrations of $\geq$ 4 ppb (nominal, 3.2 measured) significantly reduced new shell growth. The reported EC50 = 7.3 (95% C.L. = 4.9-12 ppb), nominal concentration.

Test Level (ppb)	Shell Deposition(mm)	Percent*	Measured test level
Cont.	2.55		0
Solv. Cont.(acetone)	2.00	94	
1 ppb	2.11	99	0.6
2	2.14	100	1.6
4	1.11	52	3.2
8	0.76	35	7.4
16	0.47	22	15.2
32	0.13	06	30.8

* Using the deposition of the 2 ppb test level as 100%

During the test, DO remained at 100% saturation. After 96 hours, the pH in all test containers was 8.

13. Study Author's Conclusions

Based on the criterion of new shell growth, chlorothalonil caused significant reduction at 4 ppb and higher. The shell growth was significantly higher in oysters exposed to untreated seawater compared to the solvent control. However, the author's do not believe that there was any solvent effect because the two lowest test concentrations did not show a significant difference compared to the seawater control and they contained as much solvent as the solvent control.

14. Reviewers Discussion

A. Test Procedure

The test was conducted in an acceptable manner. One problem, relative to the SEP guidance, was reported. Salinity was reported as ranging from 27 ppt to 14 ppt, dropping rapidly during the test due to heavy rains. This, apparently, had no adverse effect on the seawater control organisms. The SEP states that source of test water should be an area were salinity fluctuates less than 6%. The reported salinity change in 4 days was substantially more than 6%.

B. Statistical Analysis

Independent Statistical analysis was performed generating an EC50

C. Discussion of Results

Since the solvent was not considered by the author as having a significant effect on shell deposition, the EC50 was recalculated using the seawater control as 100%. The resulting EC50= 3.6 95% C.L. = 29 - 4.3 ppb). See attached printout of statistical calculation result. Interpreting results and determining a NOEL for a study with continious (not discrete) values is difficult. Particularly when the

solvent may have had an adverse effect on shell deposition. It is reasonable to assume that the two lowest treatment levels had minimal, if any effects on the oysters over that caused by the solvent. However, it is also assumed that in the low ppb's chlorothhalonil will significantly reduce shell deposition during a 96-hour exposure. The most conservative EC50 (3.6 ppb) will be used in risk assessments to a evaluate impact to nontarget mollusks including endangered species.

D. Category Core

15. Completion of Oneliner: Completed

16. CBI Attachments: N/A

rieder chlorothalonil eastern oyster 11-20-87

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CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB.(PERCENT)
30.8	100	95	95	0
15.2	100	82	82	0
7.4	100	70	70	0
3.2	100	56	56	0
1.6	100	16	16	0
.6	100	17	17	0

BECAUSE THE NUMBER OF ORGANISMS USED WAS SO LARGE, THE 95 PERCENT CONFIDENCE INTERVALS CALCULATED FROM THE BINOMIAL PROBABILITY ARE UNRELIABLE. USE THE INTERVALS CALCULATED BY THE OTHER TESTS.

AN APPROXIMATE LC50 FOR THIS SET OF DATA IS 2.906392

RESULTS CALCULATED USING THE MOVING AVERAGE METHOD

SPAN	G	LC50	95 PERCENT CONFIDENCE LIMITS	
5	2.327294E-02	3.569999	2.937969	4.278396

RESULTS CALCULATED USING THE PROBIT METHOD

ITERATIONS	G	H	GOODNESS OF FIT PROBABILITY
3	.162968	3.930252	3.417194E-03

SINCE THE PROBABILITY IS LESS THAN 0.05, RESULTS CALCULATED USING THE PROBIT METHOD PROBABLY SHOULD NOT BE USED.

SLOPE = 1.57533
95 PERCENT CONFIDENCE LIMITS = .9393801 AND 2.21128

LC50 = 3.463157
95 PERCENT CONFIDENCE LIMITS = 1.972898 AND 5.657444

LC10 = .5411176
95 PERCENT CONFIDENCE LIMITS = .1195157 AND 1.106666

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