122401

123-2 w/ Navicula
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072209 ref 19

DATA EVALUATION REPORT

ECOLOGICAL EFFECTS BRANCH

1. Chemical: Tilt

2. Formulation: CGA-64250 technical

3. Study ID: Data Accession No: 072209 reference 19 MRID# 00132938
Hollister, Terry. 1981. The effect of CGA-64250 to the freshwater diatom Navicula seminulum. An unpublished study prepared by EG&G Bionomics for Ciba-Geigy Corp.

4. Study Type: 11-day EC50 with Navicula seminulum freshwater diatom

5. Review By: Daniel Rieder
Wildlife Biologist
Ecological Effects Branch
Date: 10/17/84
Review Time: 3 Hrs

6. Reported Results:

11-day EC_{50} = 93 ppb based on dry cell weight as compared to the solvent control
95% Confidence Limits = 46-187 ppb
No Observed Effect Level = 51 ppb

7. Reviewers Conclusions:
This study is scientifically sound. It fulfills the guideline requirements for an aquatic plant toxicity EC50 with freshwater diatoms. The results show that Tilt will cause 50% reduction in diatom growth at 93 ppb. Tilt is very highly toxic to freshwater diatoms.

2007476

8. Methods/materials

Test Material: Tilt
Percent active ingredient: 90.7%
Test Organism: freshwater diatom
Species: Navicula seminulum Age/Stage: 11 days old
Source: National Acad. of Science, Pa.
Test Containers: glass
Size: 125 ml with 50 ml medium Conc. per container: $1X10^4$
Replicates: 3
Test Conditions: static
Illumination: 4300 lux
Temperature: 24 °C Measured concentrations: yes at initiation
Controls: untreated and solvent Test Medium: Regular Algal Assay Proc. Medium
Solvent: acetone
Reference: BMRL Testing Protocol for Static Phytotoxicity Tests with Freshwater Algae, February, 1981.

9. Results:

	Reported	Reviewer
11-day	EC_{50}=93 ppb	44.8 ppb (binomial method)
95% Confidence Limits	=46-187 ppb	26-51 ppb " "
		EC50 using moving average method is 72 ppb 95% C.L. 63-82 ppb
No Observed Effect Level	=51 ppb	

PERCENTAGE CHANGE AS COMPARED TO THE SOLVENT CONTROL

CONCENTRATION ppb Nominal/Measured*	Increase (+) or decrease (-) in production of Chlorophyl a					Dry cell weight
	day 3	day 4	day 7	day 9	day 11	day 11
control	+16	+22	+6	-1	+3	+3
solvent control**	---	---	---	---	---	---
31 / 26	-5	+4	-11	-15	-1	-3
62 / 51	-21	-16	-68	-51	-52	-64[a]
125 /109	-32	-23	-70	-73	-76	-69[a]
250 /252	-29	-31	-81	-85	-87	-85[a]
500 /649	-41	-45	-94	-92	-95	-92[a]

* at initiation of study
** solvent control used as basis for comparison
[a] significantly less ($P \leq 0.05$) than the solvent control

10. Statistical Analysis: Dry cell weight was subjected to ANOVA and Williams' method (Williams, 1971) to locate significant differences among treatment means. Each test concentration was converted to a logarithm and the corresponding percentage decrease of maximum standing crop to a probit (Finney, 1971).

11. Reviewer Evaluation

a. Methods/Procedure: The protocol is generally consistent with the guidelines in Subdivisioin J, October, 1982. The study did not mention the photoperiod.

b. Statistics: Independent statistical analysis was performed and is attached.

c. Discussion/Results: The results show that Tilt is highly toxic to freshwater diatoms.

12. Conclusions
Category: core

122101 tilt FRESHWATER DIATOM EC50

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CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB.(PERCENT)
649	100	92	92	0
252	100	85	85	0
109	100	69	69	0
51	100	64	64	0
26	100	3	3	0

THE BINOMIAL TEST SHOWS THAT 26 AND 51 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 44.8707

RESULTS CALCULATED USING THE MOVING AVERAGE METHOD

SPAN	G	LC50	95 PERCENT CONFIDENCE LIMITS	
4	.0144029	72.0149	62.6158	81.8963

RESULTS CALCULATED USING THE PROBIT METHOD

ITERATIONS	G	H	GOODNESS OF FIT PROBABIL
4	1.22253	16.6436	0

A PROBABILITY OF 0 MEANS THAT IT IS LESS THAN 0.001.

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

SLOPE = 1.84807
95 PERCENT CONFIDENCE LIMITS =-.195309 AND 3.89145

LC50 = 67.8631
95 PERCENT CONFIDENCE LIMITS = 0 AND +INFINITY

LC10 = 13.9454
95 PERCENT CONFIDENCE LIMITS = 0 AND 48.2247

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REFERENCE

EG&G Bionomics Marine Research Laboratory. 1981. Static Phytotoxicity Test with Freshwater Algae. 6pp.

Finney, D. J. 1971. Probit Analysis. Cambridge University Press, London. 333pp.

Williams, D. A. 1971. A test for difference between treatment means when several dose levels are compared with a zero dose control. Biometrics 27, 103-117