

File

10-16-95

DATA EVALUATION RECORD
ALGAE EC₅₀ TEST
GUIDELINE 123-2 (TIER II)

1. CHEMICAL: Sulfentrazone (129081)
2. TEST MATERIAL: Sulfentrazone technical; 94.2%
3. CITATION:

Authors: Blasberg, J.W., S.L. Hicks, and L.M. Stuermer

Title: Acute toxicity of F6285 to *Selenastrum capricornutum* Printz

Date: 1994

Laboratory: ABC Laboratories, Inc., Columbia, MO

Sponsor: FMC Corporation, Princeton, NJ

Lab. Report #: #40574

MRID No.: 433454-13

4. REVIEWED BY:

William Erickson
Biologist
EEB/EFED/EPA

Signature:

W. Erickson

Date:

10/13/95

5. APPROVED BY:

Harry Craven
Section Head 4
EEB/EFED/EPA

Signature:

Harry T. Craven

Date:

10/18/95

6. STUDY PARAMETERS/RESULTS SYNOPSIS:

Definitive Test Duration: 120 h

Type of Concentrations: mean measured

120-hr EC₅₀: 0.031 ppm

95% C.I.: 0.030-0.033 ppm

NOEC: 0.016 ppm

7. CONCLUSIONS: The study is scientifically sound and fulfills the guideline requirement for a freshwater algae toxicity study.
8. ADEQUACY OF THE STUDY: Core.
9. MAJOR GUIDELINE DEVIATIONS: None.
10. SUBMISSION PURPOSE: New chemical.

11. MATERIALS AND METHODS:

Test Organisms:

Guideline Criteria	Reported Information
<u>Species</u> <i>Skeletonema costatum</i> <i>Anabaena flos-aquae</i> <i>Selenastrum capricornutum</i> <i>Navicula pelliculosa</i>	<i>Selenastrum capricornutum</i>
<u>Initial Number of Cells</u> 3,000 - 10,000 cells/ml	10,000 cells/ml
<u>Nutrients</u> Standard formula, e.g. 20XAAP	algae nutrient medium with EDTA

Test System:

Guideline Criteria	Reported Information
<u>Solvent</u>	none
<u>Temperature</u> Skeletonema: 20°C Others: 24-25°C	24 ± 2°C
<u>Light Intensity</u> Anabaena: 2.0 klux (±15%) Others: 4.0-5.0 klux (±15%)	4300 lux
<u>Photoperiod</u> Skeletonema: 14 h light, 10 h dark or 16 h light, 8 h dark Others: Continuous	continuous
<u>pH</u> Skeletonema: approx. 8.0 Others: approx. 7.5	7.4

Test Design:

Guideline Criteria	Reported Information
<u>Dose range</u> 2X or 3X progression	2X
<u>Doses</u> at least 5	5

Guideline Criteria	Reported Information
<u>Controls</u> negative and/or solvent	negative
<u>Replicates per dose</u> 3 or more	3
<u>Duration of test</u> 120 hours	120 hours
<u>Daily observations were made?</u>	yes
<u>Method of Observations</u>	hemacytometer/microscope
<u>Maximum Labeled Rate</u>	0.375 lb ai/acre

12. REPORTED RESULTS:

Guideline Criteria	Reported Information
Initial and 120 h cell densities were measured?	initial cell counts at 0 hour were made only for the control; initial counts for treatments were made at 24 h; all final counts made at 120 h
Control cell count at 120 hr $\geq 2X$ initial count?	yes
Initial chemical concentrations measured? (Optional)	yes
Raw data included?	yes

72-hour Dose Response:

Dose (mg ai/L)	Cell Density (x 10 ⁴ cells/ml)	% Inhibition	120-Hour pH
Control	100	-	7.5
0.0078	120	0	7.6
0.016	110	0	7.6
0.028	69	31	7.6
0.046	8.4	92	7.4
0.081	0.15	100	7.4

Statistical Results:

Method: Nonlinear regression for EC₅₀;
Dunnett's Test for NOEC
120-h EC₅₀: 0.031 ppm
95% C.I.: 0.028-0.034 ppm
NOEC: 0.016 ppm

13. VERIFICATION OF STATISTICAL RESULTS: (results attached)

Method: Probit Analysis for EC₅₀;
Williams' Test for NOEC
120-h EC₅₀: 0.031 ppm
95% C.I.: 0.030-0.033 ppm
NOEC: 0.016 ppm

14. REVIEWER'S COMMENTS: The study is scientifically sound and fulfills the guideline requirement for a freshwater algae toxicity study.

IDENTIFICATION	ISOTONIZED MEAN	CALC. WILLIAMS	SIG P=.05	TABLE WILLIAMS	DEGREES OF FREEDOM
CONTROL	110.083				
0.0078	110.083	0.940		1.78	k= 1, v=12
0.016	110.083	0.940		1.87	k= 2, v=12
0.028	68.667	5.052	*	1.90	k= 3, v=12
0.046	8.363	13.777	*	1.92	k= 4, v=12
0.081	0.147	14.965	*	1.93	k= 5, v=12

s = 8.465

Note: df used for table values are approximate when $v > 20$.

W. ERICKSON SULFENTRAZONE SELENASTRUM TOXICITY

CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB. (PERCENT)
.081	100	100	100	0
.046	100	92	92	0
.028	100	31	31	0
.016	100	0	0	0
.0078	100	0	0	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 3.220686E-02

RESULTS CALCULATED USING THE MOVING AVERAGE METHOD

SPAN	G	LC50	95 PERCENT CONFIDENCE LIMITS
4	1.243231E-02		3.238642E-02
2.991641E-02		3.519721E-02	

RESULTS CALCULATED USING THE PROBIT METHOD

ITERATIONS	G	H
9	3.876054E-02	1
.9370867		

SLOPE = 9.149402
95 PERCENT CONFIDENCE LIMITS = 7.348096 AND 10.95071

LC50 = 3.199431E-02
95 PERCENT CONFIDENCE LIMITS = 3.031832E-02 AND 3.373127E-02

LC10 = 2.324158E-02
95 PERCENT CONFIDENCE LIMITS = 2.103778E-02 AND 2.499941E-02

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SELANASTRUM CELL COUNTS

File: A:SELANAST.DAT

Transform: NO TRANSFORM

SUMMARY STATISTICS ON TRANSFORMED DATA TABLE 1 of 2

GRP	IDENTIFICATION	N	MIN	MAX	MEAN
1	CONTROL	3	97.500	114.750	103.583
2	0.0078	3	100.750	127.250	116.500
3	0.016	3	97.000	117.000	110.167
4	0.028	3	66.750	70.250	68.667
5	0.046	3	6.670	11.750	8.363
6	0.081	3	0.000	0.330	0.147

SELANASTRUM CELL COUNTS

File: A:SELANAST.DAT

Transform: NO TRANSFORM

SUMMARY STATISTICS ON TRANSFORMED DATA TABLE 2 of 2

GRP	IDENTIFICATION	VARIANCE	SD	SEM
1	CONTROL	93.771	9.684	5.591
2	0.0078	194.313	13.940	8.048
3	0.016	130.083	11.405	6.585
4	0.028	3.146	1.774	1.024
5	0.046	8.602	2.933	1.693
6	0.081	0.028	0.168	0.097

SELANASTRUM CELL COUNTS

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WILLIAMS TEST (Isotonic regression model) TABLE 1 OF 2

GROUP	IDENTIFICATION	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	CONTROL	3	103.583	103.583	110.083
2	0.0078	3	116.500	116.500	110.083
3	0.016	3	110.167	110.167	110.083
4	0.028	3	68.667	68.667	68.667
5	0.046	3	8.363	8.363	8.363
6	0.081	3	0.147	0.147	0.147

SELANASTRUM CELL COUNTS

File: A:SELANAST.DAT

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WILLIAMS TEST (Isotonic regression model) TABLE 2 OF 2

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