16 6-13-00

MRID No.: 445051-22

DATA EVALUATION RECORD
ALGAE OR DIATOM EC_{50} TEST
GUIDELINE 123-2 (TIER II)

1. **CHEMICAL:** Mesotrione PC Code No.: 122990

2. **TEST MATERIAL:** ZA1296 Purity: 96.8%

3. **CITATION**

Authors: D.V. Smyth, S.J. Kent, and N. Shillabeer
Title: ZA1296: Toxicity to the Blue-Green Alga *Anabaena flos-aquae*
Study Completion Date: July 13, 1996
Laboratory: Brixham Environmental Laboratory, Brixham Devon, UK
Sponsor: ZENECA Ag Products, Wilmington, DE
Laboratory Report ID: BL5801/B
DP Barcode: D245475
MRID No.: 445051-22

4. **REVIEWED BY:** Max Feken, M.S., Environmental Toxicologist, Golder Associates Inc.

Signature: [signature] **Date:** 8/25/98

APPROVED BY: Pim Kosalwat, Ph.D., Senior Scientist, Golder Associates Inc.

Signature: P. Kosalwat **Date:** 8/25/98

5. **APPROVED BY:**

Signature: [signature] **Date:** 6/13/00

6. **STUDY PARAMETERS**

Definitive Test Duration: 120 hours
Type of Concentrations: Mean measured

7. **CONCLUSIONS:** This study is scientifically sound and fulfills the guideline requirements for an algal toxicity test.

Results Synopsis - Based on mean measured concentrations

EC_{50}: 132 ppm 95% C.I.: Not determined

NOEC: 56 ppm Probit Slope: N/A

8. ADEQUACY OF THE STUDY

A. Classification: Core

B. Rationale: N/A

C. Repairability: N/A

9. GUIDELINE DEVIATIONS

1. Initial cell density (20,000 cells/mL) was greater than recommended (3,000 cells/mL).

2. The initial pH of the two highest concentration levels (4.1 and 3.7 for 100 and 180 mg/L nominal concentrations, respectively) was much lower than recommended (7.5).

10. SUBMISSION PURPOSE:

11. MATERIALS AND METHODS

A. Test Organisms

Guideline Criteria	Reported Information
Species *Skeletonema costatum* *Anabaena flos-aquae* *Selenastrum capricornutum* *Navicula pelliculosa*	*Anabaena flos-aquae*
Initial Number of Cells 3,000 - 10,000 cells/mL	20,000 cells/mL
Nutrients Standard formula, e.g. 20XAAP	Algal medium by Miller et al. (1978)

B. Test System

Guideline Criteria	Reported Information
Solvent	None
Temperature Skeletonema: 20°C Others: 24-25°C	23.8 - 23.9°C

Guideline Criteria	Reported Information
Light Intensity Anabaena: 2.0 KLux (±15%) Others: 4.0-5.0 KLux (±15%)	3.23 KLux
Photoperiod Skeletonema: 14 h light, 10 h dark or 16 h light, 8 h dark Others: Continuous	Continuous
pH Skeletonema: approx. 8.0 Others: approx. 7.5	Initial: 3.7 - 7.5 Final: 3.6 - 7.8

C. Test Design

Guideline Criteria	Reported Information
Dose range 2X or 3X progression	1.8X
Doses at least 5	3.2, 5.6, 10, 18, 32, 56, 100, and 180 mg/L
Controls negative and/or solvent	Negative control
Replicates per dose 3 or more	3 (6 in the control)
Duration of test 120 hours	120 hours
Daily observations were made?	Yes
Method of Observations	Algal cell absorbance
Maximum Labeled Rate	Not reported

12. REPORTED RESULTS

Guideline Criteria	Reported Information
Initial and 120 h cell densities were measured?	Yes
Control cell count at 120 hr ≥2X initial count?	Yes

Guideline Criteria	Reported Information
Initial chemical concentrations measured? (Optional)	Yes
Raw data included?	Yes

Dose Response

Concentration (mg/L)		Algal cell absorbance*	% reduction	120-Hour pH
Nominal	Mean Measured			
Control	<0.018	1.92	--	7.8
3.2	3.2	1.83	5	7.8
5.6	5.4	1.86	3	7.7
10	9.9	1.85	4	7.7
18	17	1.87	3	7.8
32	32	1.78	7	7.7
56	54	1.94	0	7.6
100	96	<0.016	99	4.1
180	175	<0.016	99	3.6

* Inoculum (Day 0) calculated cell absorbance = 0.006 (20,000 cells/mL)

Other Significant Results: Area under the growth curve was the most sensitive endpoint measured in this study.

Statistical Results for Area Under the Growth Curve

Statistical Method: Probit for the EC_{50} and Dunnett's test for mean separation. Results based on nominal concentrations.

EC_{50}: 54 mg/L 95% C.I.: 29 - 160 mg/L

Probit Slope: Not reported NOEC: 32 mg/L

Statistical Results for Growth Rate

Statistical Method: Visual inspection and Dunnett's test for mean separation. Results based on nominal concentrations.

EC_{50}: >180 mg/L 95% C.I.: N/A

Probit Slope: N/A NOEC: 56 mg/L

13. VERIFICATION OF STATISTICAL RESULTS

Statistical Method: Binomial probability and visual inspection. Results based on mean measured concentrations.

EC_{50}: 132 ppm 95% C.I.: Not determined

Probit Slope: N/A NOEC: 56 ppm

14. REVIEWER'S COMMENTS: This study is scientifically sound and fulfills the guideline requirements for an algal toxicity test. Based on mean measured concentrations, the 120-hour EC_{50} and NOEC for *Anabaena flos-aquae* exposed to ZA1296 were 132 and 56 ppm, respectively. This study is classified as **Core.**

MAX FEKEN ZA1296 ANABAENA 08-04-98

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CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB. (PERCENT)
175	100	99	99	0
96	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 131.5911

WHEN THERE ARE LESS THAN TWO CONCENTRATIONS AT WHICH THE PERCENT DEAD IS BETWEEN 0 AND 100, NEITHER THE MOVING AVERAGE NOR THE PROBIT METHOD CAN GIVE ANY STATISTICALLY SOUND RESULTS.

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