

Du Pont HLR 349-90

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Study Title

STATIC ACUTE 48-HOUR EC50 OF [REDACTED] TO DAPHNIA MAGNA

Data Requirement

United States Environmental Protection Agency
Environmental Effects Test Guidelines
Subdivision EG-1

Author

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Study Completed On

16 July 1990

Performing Laboratory

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Laboratory Project ID

Haskell Laboratory Report No. 349-90

[REDACTED]
Page 1 of 13

Company Sanitized. Does not contain TSCA CBI

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GOOD LABORATORY PRACTICE STATEMENT

This study was conducted according to United States Environmental Protection Agency's Good Laboratory Practice Regulations (40 CFR 792) for TSCA. Areas of non-compliance are documented in the study records. No deviations existed that significantly affected the validity of the study.

Sponsor: E. I. du Pont de Nemours and Co., Inc.

Submitter: Chemicals and Pigments Department

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27 June 90
Day/Mo/Yr

Du Pont HLR 349-90

QUALITY ASSURANCE DOCUMENTATION

UDY: [REDACTED]
H# 18,267

STATIC ACUTE 48-HOUR EC50 OF [REDACTED] TO DAPHNIA MAGNA

AUDITS:

Items Audited

Audit Dates

Protocol, Conduct

5/24/90

Records, Report

7/5-6/90

SHORT-TERM AUDIT REPORT NUMBER: [REDACTED]
DATE FINDINGS REPORTED TO MANAGEMENT AND STUDY DIRECTOR: 7/6/90

Reported by:

William J. Lynam

William J. Lynam
Quality Assurance Auditor

7/16/90

Date

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I. PURPOSE

The objective was to assess the acute toxicity of [REDACTED] to Daphnia magna neonates less than 24 hours old.

II. INTRODUCTION/SUMMARY

[REDACTED] exhibited no acute toxicity to Daphnia magna neonates (less than 24 hours old) in an unaerated, static 48 hour test. Nominal concentrations were 1311, 1638, 2048, 2560, 3200, and 5000 mg/L. The 48-hour EC50 could not be calculated because 5000 mg/L, the highest concentration tested, failed to cause immobilization of the daphnids.

RECORDS

All data and the final report will be maintained either at Haskell Laboratory for Toxicology and Industrial Medicine (Newark, Delaware) or be archived at the Du Pont Records Management Center (Wilmington, Delaware).

Technician:

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27 June 90
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THIS REPORT IS APPROVED FOR ISSUE.

Kevin N. Baer
Kevin N. Baer, Ph.D.
Study Director

16 July 90
Day/Mo/Year

GENERAL INFORMATION

Material Tested:

Medical Research Number:

Haskell Number:

18,267

Synonyms:

Purity:

Composition:

Sponsor:

Chemicals and Pigments Department
E. I. du Pont de Nemours and Co., Inc.
Jackson Lab

Submitted by:

Chemicals and Pigments Department
E. I. du Pont de Nemours and Co., Inc.
Jackson Lab

Study Schedule:

Study Initiation: 21 May 1990
Experimental Start: 24 May 1990
Experimental Termination: 26 May 1990
Study Completion: 16 July 1990

Notebooks:

Haskell Laboratory Cost Code:

Distribution:

III. MATERIALS AND METHODS

A. Test Material

Source, composition and purity of [REDACTED] are described under General Information. The appropriate quantity of [REDACTED] for each concentration was weighed and dissolved in 1 liter of filtered fish tank water (see below) and then distributed into four 0.25 liter containers in the water bath. Stability and solubility of [REDACTED] in dilution water were not determined.

B. Dilution Water

Water (Table 1) originated from the Haskell Laboratory well and flowed through aquaria containing fathead minnows (Pimephales promelas) prior to use in these daphnid tests.

C. Animal Culture

Parent Daphnia magna were reared at Haskell Laboratory in 2-L pyrex beakers (21 per beaker) which contained 1.8 L of filtered dilution water held at approximately 20°C. Daphnids were fed 30 mg/L (dry weight) of a mixture of frozen Purina (same as Buckshire) trout chow and Fleischmann's yeast three times weekly during the water renewal process. Neonates were collected from 15 day old parent daphnids for use in these tests. Sickness, injury or abnormality was not present. Animals were identified by labels on the beakers or test vessels.

D. Test Methods [1]

Six test concentrations and a water control were prepared using filtered fish tank water. Nominal test concentrations were 1311, 1638, 2048, 2560, 3200 and 5000 mg/L.

Pyrex beakers (250 mL; 6.1-cm diameter) containing 200 mL of test solution (6.8-cm depth) were used. Each replicate (four per concentration) contained five daphnids (<0.1 g daphnid/L). Daphnids were added to the water control and to test beakers beginning with the lowest concentration. Random assignment was not used to avoid contamination of test solutions of low concentration from the transfer pipette when daphnids were released under the water surface. Daphnids were not fed during the test. Test solutions were held between 19.9 and 20.1°C (mean 20.0°C) and were unaerated. A photoperiod of 16 hours light (506 to 592 Lux) versus 8 hours darkness was employed.

Dissolved oxygen and pH were measured in the water controls and in all replicates of every test concentrations before daphnids were added at the beginning and at the end of the test. Total alkalinity, EDTA hardness and conductivity of the dilution water were measured at the beginning of the test. Temperatures were taken with an American Society of Testing Materials calibrated mercury thermometer.

B. Chemical Analysis

No chemical analyses of the test solutions were performed.

IV. RESULTS AND DISCUSSION

An earlier rangefinding study was conducted but the results will not be reported in this study.

Test solutions of [REDACTED] exhibited a milky white color. All chemical and physical parameters (Tables 2, 3 and 4) were within expected ranges. The 48-Hr EC50 could not be calculated because 5000 mg/L, the highest concentration tested, failed to cause immobilization of the daphnia (Table 5).

V. CONCLUSION

[REDACTED] exhibited no acute toxicity in this static, unaerated 48-hour Daphnia magna test. The EC50 was greater than 5000 mg/L, the highest concentration tested.

VI. LITERATURE CITED

1. United States Environmental Protection Agency, Office of Toxic Substances, Guidelines for Testing Chemicals, EG-1, Washington, DC., August 1982.

TABLE 1

Chemical Characteristics of Haskell Laboratory Well Water¹

Parameter	Concentration	Parameter	Concentration
BOD, mg/L	5	Fluoride ³ , mg/L	<0.1
COD, mg/L	<10	Lead, mg/L	<0.075
DOC, mg/L	<1.0	Magnesium, mg/L	3.9
TOC ² , mg/L	0.8	MBAS/LAS, mg/L	<0.05
Kjeldahl N, mg/L	<0.2	Mercury, mg/L	<0.00020
Ammonia N, mg/L	<0.2	Nickel, mg/L	<0.020
Organic N, mg/L	<0.2	Nitrite ³ , mg/L	<0.1
Turbidity, NTU	<1.0	Nitrate ³ , mg/L	1.7
Phenolics, mg/L	<0.05	Phosphate ³ , mg/L	<0.1
Color, Co/Pt	<5	Potassium, mg/L	1.8
Solids		Selenium, mg/L	<0.005
total suspended, mg/L	<4	Silver, mg/L	<0.010
Aluminum, mg/L	<0.100	Sodium, mg/L	8.1
Antimony, mg/L	<0.060	Sulfate ³ , mg/L	5.0
Arsenic, mg/L	<0.010	Sulfide, mg/L	0.11
Beryllium, mg/L	<0.001	Zinc, mg/L	<0.020
Boron, mg/L	<0.021	Volatile priority	
Cadmium, mg/L	<0.002	pollutants	ND ⁵
Calcium, mg/L	25.4	Acid extractable	
Chloride ³ , mg/L	6.3	priority pollutants	ND ⁶
Chromium, mg/L	<0.010	Base/neutral	
Cobalt, mg/L	<0.020	priority pollutants	ND ⁶
Copper, mg/L	<0.010	Pesticides/PCBs	ND ⁶
Cyanide, mg/L	<0.025	Organophosphate	
Iron ³ , mg/L	0.131	pesticides ⁴ , ug/L	<0.50

¹Date of analyses 24 October 1989 unless indicated otherwise.

²Date of analyses 5 December 1989.

³Date of analyses 11 December 1989.

⁴Date of analyses 26 September 1989.

⁵None detected except methylene chloride was below the published Method Detection Limit (BMDL).

⁶None detected.

TABLE 2

Water Chemistry of the Water Control at Test Start

Total Alkalinity ^a (mg/L as CaCO ₃)	EDTA Hardness ^a (mg/L as CaCO ₃)	Conductivity ^b (μmhos/cm)
76	77	162

^aHach kit, Hach Chemical Company, Loveland, CO.

^bYSI Model 33, Yellow Springs Instruments, Yellow Springs, OH.

TABLE 3

Dissolved Oxygen Concentrations of [REDACTED] Test Solutions

Nominal Concentration (mg/L)	Dissolved Oxygen ¹ (mg/L)							
	0 Hours				48 Hours			
	A ²	B ²	C ²	D ²	A ²	B ²	C ²	D ²
Water Control	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8
1311	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8
1638	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8
2048	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8
2560	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8
3200	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8
5000	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8

¹YSI Model 33, Yellow Springs Instruments, Yellow Springs, OH.²Five daphnids in each replicate.

TABLE A
pH of [REDACTED] Test Solutions

Nominal Concentration (mg/L)	pH ¹							
	0 Hours				48 Hours			
	A ²	B ²	C ²	D ²	A ²	B ²	C ²	D ²
Water Control	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7
1511	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7
1638	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7
2048	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7
2560	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7
3200	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7
5000	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7

¹Corning Model 610A, Corning Scientific Instruments, Medfield, MA.

²Each replicate contained 5 daphnids.

TABLE 5

Observed Immobility of Daphnia magna Exposed to [REDACTED]
for 48 Hours in a Static, Unagitated Test

Nominal Concentration (mg/L)	Percent Cumulative Observed Immobility							
	24 Hours				48 Hours			
	A ¹	B ¹	C ¹	D ¹	A ¹	B ¹	C ¹	D ¹
Water Control	0	0	0	0	0	0	0	0
1311	0	0	0	0	0	0	0	0
1638	0	0	0	0	0	0	0	0
2048	0	0	0	0	0	0	0	0
2560	0	0	0	0	0	0	0	0
3200	0	0	0	0	0	0	0	0
5000	0	0	0	0	0	0	0	0

¹Each replicate contained five daphnids.