

Copies to: [REDACTED]

E. I. du Pont de Nemours and Company
Haskell Laboratory for Toxicology and Industrial MedicineHASKELL LABORATORY REPORT NO. 58-78

MR NO. [REDACTED]

Material Tested

Haskell No.

Sample Ready
for Testing

Other Codes

Material Submitted by

11,890

12/2/77

Textile Fibers Department
Seaford, Delaware96-HOUR LC50² TO BLUEGILL SUNFISH

Procedure: The test material, in original form, was introduced into all-glass exposure vessels and diluted with laboratory supply water to yield the desired concentrations in a 7.5 l final volume. An identical jar containing only supply water was designated as a control. Ten bluegill sunfish (*Lepomis macrochirus*; 3.0 cm standard length) were randomly placed into each test vessel. Mortality counts and observations were made every 24 hours for a total of 96 hours after initiating exposure. Dead fish were removed at the time of discovery. Fish were not fed 48 hours prior to testing nor during exposure. No aeration was provided during the test, and temperature was maintained at $20^{\circ} \pm 0.2^{\circ}\text{C}$. Dissolved oxygen and pH measurements were taken at the beginning and end of exposure. Calculation of the 96-hour LC50 and confidence limits was by probit analysis (Finney, 1971).³

RESULTS: Definitive Test

Test Concentration (% v/v)	Observed Mortality (%)	pH		Dissolved Oxygen (ppm)		Observations
		Initial	Final	Initial	Final	
100	100	9.5	9.5	8.5	8.5	• Complete mortality was observed within one hour at the 100% test concentration. • 96-hour LC50: 16.6% 95% Confidence Limits: 14.5% and 18.5% • Dose-Response Slope: 9.1 95% Confidence Limits: 5.2 and 13.0
56	100	9.4	9.3	9.9	9.6	
32	100	9.1	9.0	9.5	8.1	
24	100	9.0	8.8	9.4	7.6	
20	80	8.7	8.2	9.0	3.4	
18	50	8.7	7.6	9.1	2.6	
13.5	10	8.6	7.5	9.5	3.8	
10	10	8.3	6.9	9.3	3.1	
7.5	0	8.3	7.2	9.4	3.4	
Control	0	6.5	6.6	9.8	4.6	

Company Sanitized. Does not contain TSCA CBI

RESULTS Con't.

At the concentrations studied, the initial pH of the test material ranged from 8.3 to 9.5. Since pH extremes beyond normal physiological levels can potentially cause or contribute to a toxicological response, a supplementary study was performed with test material neutralized to pH 7.0 by the addition of hydrochloric acid.

Supplementary Test

Test Concentration (% v/v)	Observed Mortality (%)	pH		Dissolved Oxygen (ppm)		Observations
		Initial	Final	Initial	Final	
100	100	7.0	6.8	8.5	8.2	• Complete mortality was observed within 3.5 hours at 100% test concentration.
56	100	7.0	6.9	8.7	8.2	
32	100	7.0	7.0	9.1	7.9	
24	100	7.0	6.9	9.0	4.5	
10	0	7.0	6.8	9.0	3.8	

Summary: [REDACTED] exhibits very low acute toxicity to bluegill sunfish under static unaerated test conditions during a 96-hour exposure. It's 96-hour LC50 is 16.6% with 95% confidence limits of 14.5% and 18.5%. The slope of the dose-response curve is 9.1 with 95% confidence limits of 5.2 and 13.0. The supplementary test using neutralized solutions of the material demonstrated a 96-hour LC50 greater than 10% but less than 24%. A comparison of the LC50 values for the definitive and supplementary tests indicates that the pH of the original material did not appreciably contribute to the acute toxicity observed in the definitive test.

¹ Composition of [REDACTED]

² LC50 = The concentration which is lethal to 50% of a population of test organisms during the specified time period.

³ Finney, D. J., Probit Analysis, 3rd ed., 1971. Cambridge University Press.

Report by: [REDACTED]

Edward J. Smith, Technician

Approved by: [REDACTED]

Philip W. Schneider, Jr.
Chief, Aquatic Toxicology

[REDACTED]
EJS/cgs

Date Issued: 2/10/78

Report No. 58-78

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[REDACTED]
DOSE IS EXPRESSED AS %

SCALE OF DOSE IS TRANSFORMED TO LOG(10)

INPUT DATA

DOSE	LOG DOSE	# EXPOSED	# RESPONDING	RATE	PROBIT
100.0000	2.0000	10.	10.	0.9999	8.7191
56.0000	1.7482	10.	10.	0.9999	8.7191
32.0000	1.5051	10.	10.	0.9999	8.7191
24.0000	1.3802	10.	10.	0.9999	8.7191
20.0000	1.3010	10.	8.	0.8000	5.8407
18.0000	1.2553	10.	5.	0.5000	4.9927
13.5000	1.1303	10.	1.	0.1000	3.7131
10.0000	1.0000	10.	1.	0.1000	3.7131
7.5000	0.8751	10.	0.	0.0001	1.2809

CONTROL SAMPLE SIZE = 10.
CONTROL RESPONSES = 0.
SPONTANEOUS RESPONSE RATE = 0.00000

HETEROGENEITY FACTOR = 1.0000
NUMBER OF POINTS = 9
DEGREES OF FREEDOM = 7
DEVIATE = 1.9600
G = 0.1835
NUMBER OF CYCLES = 1
AVG X = 1.2406
AVG Y = 1.1924
AVG V = 1.8291
SLOPE = 0.1274
INTERCEPT = 16.1314
CHI SQUARED = 5.0093

LL = 5.2171 UL = 13.0376

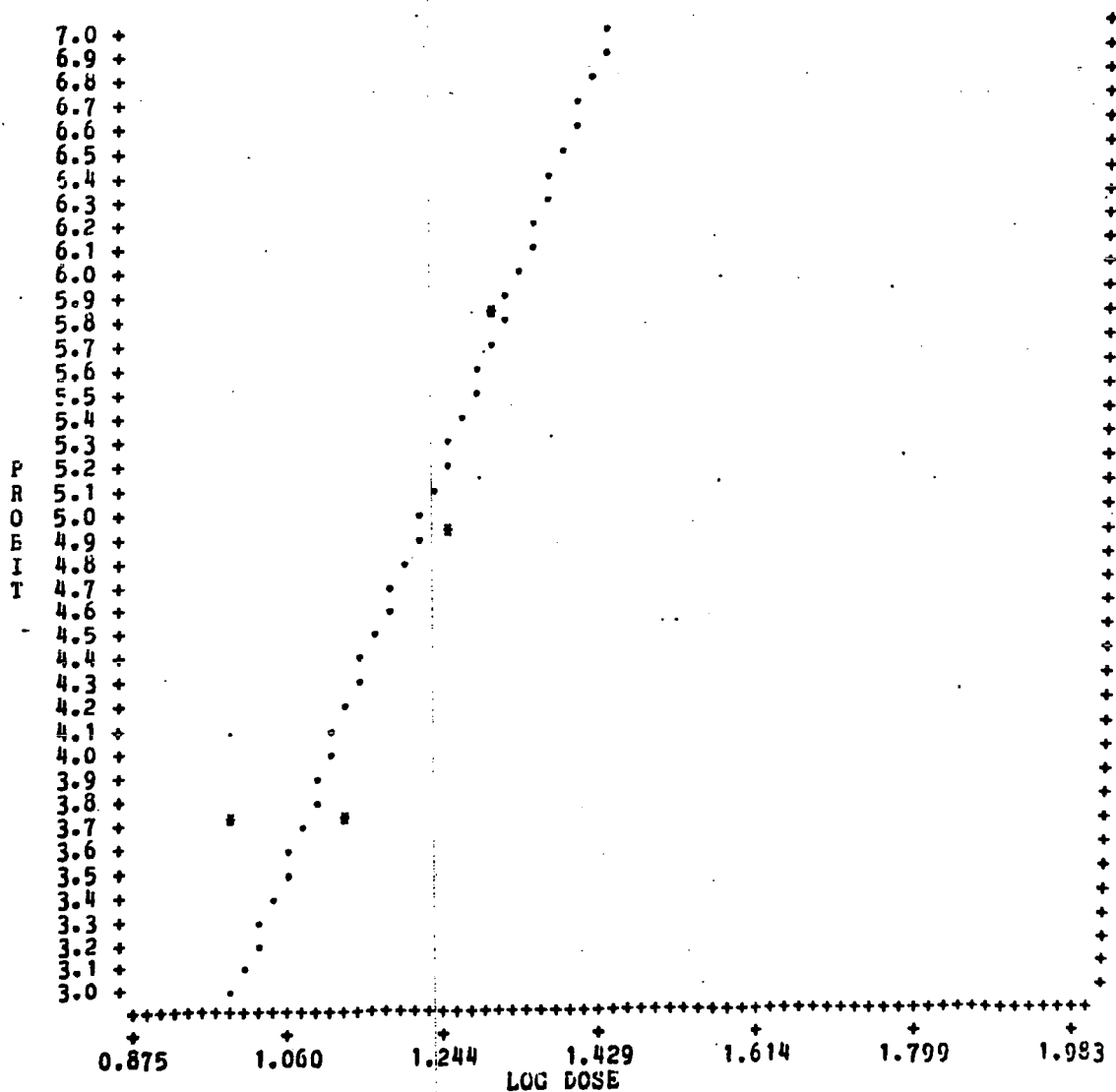
POINT	DOSE	95% CONFIDENCE LIMITS	
		LOWER	UPPER
P = .01	9.2192	5.6081	11.3895
P = .05	10.9483	7.5227	12.9567
P = .10	11.9992	8.7788	13.8760
P = .20	13.4078	10.5420	15.1658
P = .50	16.5792	14.5101	18.5346
P = .60	20.5006	18.3551	24.6468
P = .90	22.9075	20.2029	29.3894
P = .95	25.1062	21.7364	34.1915
P = .99	29.8150	24.7601	45.7326

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PLOT OF THE MAXIMUM LIKELIHOOD LINE FOR [REDACTED]

THE MAXIMUM LIKELIHOOD ESTIMATES ARE:
SLOPE= 9.1274
INTERCEPT= -6.1314
SPONTANEOUS RESPONSE RATE=0.00000



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