

MICROBICS MICROTOX® TOXICITY TEST

TEST SUBSTANCE

Identity: Mixture containing perfluorooctanesulfonate which may also be referred to as PFOS, FC-95, or as a component of FC-3017. (1-Octanesulfonic acid) (CAS # 2795-39-3).

Remarks: The 3M production lot number was not noted. The test sample is FC-3017. Current information indicates FC-3017 is a mixture of 0.67% PFOS, 20% diethylene glycol butyl ether, 55.41% water, 21% ethylene glycol, 1.33% Hydroxy foamer, 1% sodium octyl sulfate, 0.5% polyoxyethylene monooctylphenyl ether, 0.04% sodium lauryl sulfate, and 0.05% tolyltraizole.

The following summary applies to a mixture with incompletely characterized concentrations of impurities. Data may not accurately reflect toxicity of the fluorochemical component of the test sample.

METHOD:

Method: Microbics Microtox® "BASIC" Procedure

Test type: Acute static

GLP: No

Year Completed: 1995

Species: *Photobacterium phosphoreum*

Analytical monitoring: pH and osmotic condition.

Exposure period: 30-minutes

Statistical methods: EC50 values calculated by statistical linear regression program provided for Microtox®

Test organism source: Microbics' Reagent.

Test conditions:

Diluent: Millipore Milli-Q™ water

Test temperature: Not noted.

Stock and test solution preparation: A 2000 mg/L primary stock solution was prepared by dissolving 200 mg of test substance in 100 mL of Millipore Milli-Q™ water. The pH of the stock solution was 6.0, and an osmotic adjustment was made using 200 mg NaCl dissolved in 10 mL stock solution. Appearance of test solutions was noted as "clear". All test solutions were made by proportional dilutions.

Exposure vessels: 4 mL cuvettes.

Number of replicates: two

Number of concentrations: Four plus a blank control

Element basis: Percent light loss

RESULTS

Nominal concentrations: Blank control, 125, 250, 500, and 1000 mg/L

Element value: 5-minute EC₅₀ = >1000 mg/L
 15-minute EC₅₀ = 785 (728 – 846) mg/L
 30-minute EC₅₀ = 558 (541 – 574) mg/L

Element values based on nominal concentrations.

Remarks: Testing was conducted on the mixture as described in the Test Substance Remarks field. The values reported apply to that mixture and not the fluorochemical proportion alone.

CONCLUSIONS

The test substance 15-minute EC₅₀ for *Photobacterium phosphoreum* was determined to be 558 mg/L with a 95% confidence interval of 541 to 574 mg/L.

Submitter: 3M Company, Environmental Laboratory, P.O. Box 33331, St. Paul, MN, 55133

DATA QUALITY

Reliability: Klimisch ranking = 2. Testing meets all criteria for quality testing. However, sample purity was not properly characterized and it lacks analytical confirmation of the amount of fluorochemical proportion in the solution.

REFERENCES

This study was conducted by the 3M Environmental Laboratory, St. Paul, MN, Lab Request number N3188, 1995.

OTHER

Last changed: 6/26/00.

ENVIRONMENTAL LABORATORY: MICROTOX PREP SHEET

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LR: N 253
Date: 4/26/95
Analyst: ELO

TEST SUBSTANCE: EC-3017

1. Preparation of Stock Solution

- * Mass/Vol. Test Substance: 200mg/100mL
- * Final Dilution Volume: 2g/L
- * Diluent: MILLI Q H₂O
- * Final Concentration of Stock Solution: 2g/L

2. pH Adjustment of Stock Solution

- * Initial pH of Stock Solution: 6.0
- * pH Adjusted to: —
- * pH Adjusted with: —

3. Osmotic Adjustment of Stock Solution

- * Osmotic Adjuster: NaCl
- * Comments: Added 10mL of 2g/L stock solution to 200mg NaCl

4. Appearance of pH and Osmotically Adjusted Stock Solution

- * CLEAR or OPAQUE (circle one)

* Color: —

* Comments: —

5. Comments

—
—
—

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MICROTOX DATA REPORT

FILE NAME: N3168.K5

TEST DATE: 9/26/95

TEST TIME: 11:00 AM

Investigator: CWJ

Approved by: _____

Sample Description: EC-3017

Procedure: BASIC

Osmotic Adjustment: None

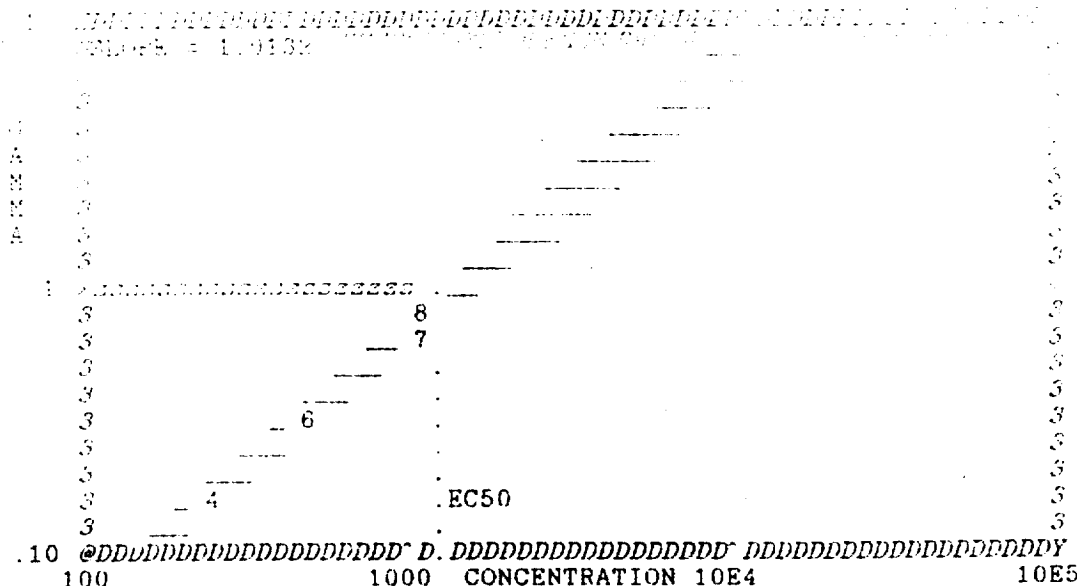
Initial Concentration: 1000 mg/L

Dilution Factor: _____

Test Time: 5 minutes

Concentration Units: mg/L

NUMBER	IO/IT	CONC.	GAMMA
1	86.13/ 55.50	125.0000	0.0441
2	85.85/ 55.86	125.0000	0.0441
3	87.73/ 50.66	250.0000	0.1341#
4	86.74/ 50.78	250.0000	0.1341#
5	85.51/ 43.38	500.0000	0.2008#
6	83.45/ 43.03	500.0000	0.2008#
7	80.15/ 31.90	1000.0000	0.2744#
8	74.37/ 20.15	1000.0000	0.2744#
MEAN		88.77/ 31.42	83.64/ 93.71**
STDEV		0.623	0.681**
COEFFICIENT OF VARIATION		0.692	



EC501304.9501 (95% CONFIDENCE RANGE:1116.0963 TO 1525.7596)

Used for calculations

STATISTICAL REPORT FOR DATA FILE N3133.H3

ESTIMATING EQUATION: $\log C = 0.9769 \times \log B + 5.1136$

NUMBER OF DATA PAIRS USED: 4

RESIDUAL VARIANCE: 0.000001

95% CONFIDENCE FACTOR: 1.19901 FOR EC50

CORRELATION COEFFICIENT: 0.99491

COEFFICIENT OF DETERMINATION: R² = 0.98980

EFFECTIVE CONCENTRATIONS 95% CONFIDENCE RANGE:

EC01	1004.9901 mg/L	EC100	1114.8000 mg/L
EC05	387.0400 mg/L	EC95	1011.0000 mg/L
EC10	1004.9901 mg/L	EC90	1011.0000 mg/L
EC01	11.6000 mg	EC100	11.6000 mg

*** EXTRAPOLATED RESULTS

INITIAL DATA			N3158.K2	
NUMBER	CONCENTRATION	GAMMA	% EFFECT	
1	100.0000	0.075	6.46	
2	100.0000	0.164	16.14	
3	250.0000	0.193	18.61	
4	250.0000	0.183	18.48	18.14
5	500.0000	0.365	18.14	
6	500.0000	0.343	18.14	18.14
7	1000.0000	0.746	42.52	
8	1000.0000	0.818	44.98	44.98

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FINAL RESULT			N3158.K2	
NUMBER	CONCENTRATION	GAMMA	GAMMA REF.	% EFFECT
3	250.0000	0.1830	0.1858	18.61
4	250.0000	0.1839	0.1858	18.48
5	500.0000	0.3651	0.3746	26.744
6	500.0000	0.3430	0.3746	25.542
7	1000.0000	0.7400	0.7560	42.528
8	1000.0000	0.8178	0.7560	44.982

EC501304.9501 mg/L (95% CONFIDENCE RANGE:1116.0963 TO 1925.7596)

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MICROTOX DATA REPORT

FILE NAME: NS188.K15

TEST DATE: 2/26/95

TEST TIME: 15:00:00

Investigator: C. J.

Approved by:

Sample Description: EC-3017

Procedure: BASIC

Osmotic Adjustment: NaCl

Initial Concentration : 1000 mg/L

Dilution Factor : 2

Test Time: 15 minutes

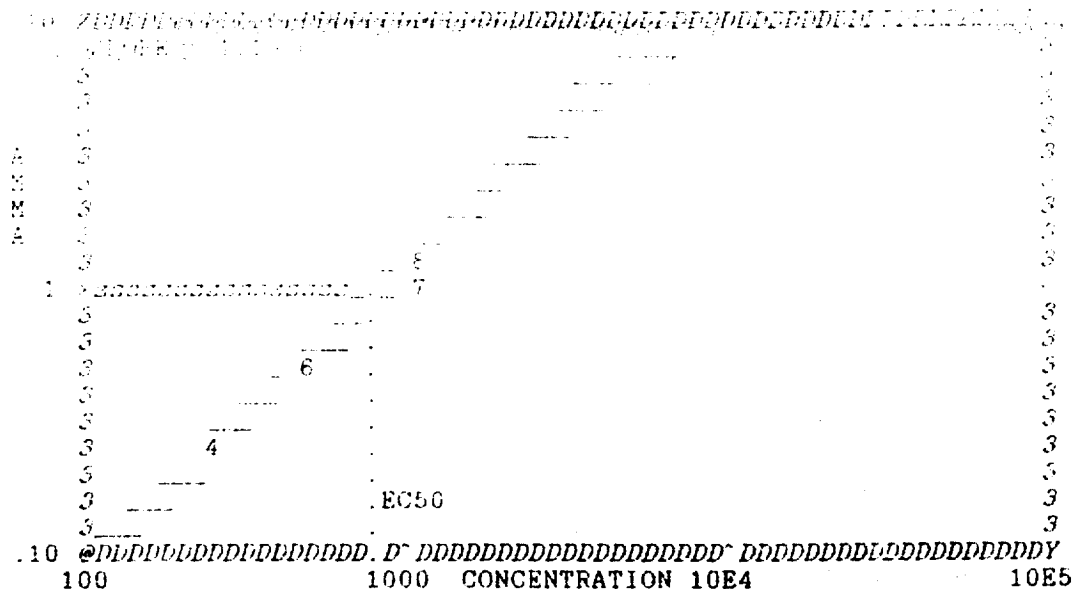
Concentration Units: mg/L

NUMBER	LOGIT	CONC.	GAMMA
1	56.137 45.13	125.0000	0.11767
2	55.817 40.82	156.0000	0.09450
3	55.757 38.74	198.0000	0.07411#
4	55.747 39.75	250.0000	0.06897#
5	55.517 31.45	500.0000	0.03009#
6	53.457 30.73	500.0000	0.02634#
7	50.157 21.00	1000.0000	0.01017#
8	38.777 18.22	1000.0000	0.00302#

ANTAGONIST: 1 55.747 39.74 54.547 30.70**

SALT: 0 55.747 39.74 54.547 30.70**

PRETREATMENT: 0 55.747 39.74 54.547 30.70**



Used for calculations

STATISTICAL REPORT FOR DATA FILE N3188.K15

ESTIMATING EQUATION: $\text{LOG } C = 0.9025 \times \text{LOG } b + 2.8948$

NUMBER OF DATA PAIRS USED: 6

RESIDUAL VARIANCE: 0.00050

95% CONFIDENCE FACTOR: 1.07744 FOR EC50

CORRELATION COEFFICIENT: $R = 0.99724$

COEFFICIENT OF DETERMINATION: $R^2 = 0.99450$

EFFECTIVE CONCENTRATIONS (95% CONFIDENCE RANGE):

EC50 = 784.8150 mg/L	(728.4058 TO 845.5927)
EC20 = 224.6047 mg/L	(203.0035 TO 248.5043)***
EC10 = 108.0389 mg/L	(91.2765 TO 127.8797)***
EC01 = 12.4091 mg/L	(8.4346 TO 18.2565)***

*** EXTRAPOLATED RESULTS

INITIAL DATA

N3188.K15

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NUMBER	CONCENTRATION	GAMMA	% EFFECT	
1	125.0000	0.118	10.53	
2	125.0000	0.092	8.47	9.50
3	250.0000	0.296	22.85	
4	250.0000	0.277	21.69	22.27
5	500.0000	0.592	37.20	
6	500.0000	0.590	37.12	37.16
7	1000.0000	1.235	55.26	
8	1000.0000	1.409	58.50	56.88

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FINAL RESULTS

N3188.K15

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NUMBER	CONC.	GAMMA	GAMMA EST.	% EFFECT
3	250.0000	0.2961	0.2827	22.846
4	250.0000	0.2770	0.2827	21.690
5	500.0000	0.5923	0.6068	37.197
6	500.0000	0.5903	0.6068	37.120
7	1000.0000	1.2352	1.3025	55.261
8	1000.0000	1.4094	1.3025	58.496

EC50 784.8150 mg/L (95% CONFIDENCE RANGE 428.4058 TO 845.5927)

MICROTOX DATA REPORT

FILE NAME: N3188.K30

TEST DATE: 9/26/95
TEST TIME: 10:30 am

Investigator: GWJ
Sample Description: FC-3017
Procedure: BASIC

Approved by: _____

Initial Concentration : 1000 mg/L
Test Time: 30 minutes

Osmotic Adjustment: NaCl
Dilution Factor : 2
Concentration Units: mg/L

Test Time: 30 minutes

NUMBER	IO/IT	CONC.	GAMMA
1	86.13/ 41.59	125.0000	0.16644
2	85.85/ 42.15	125.0000	0.14720
3	87.73/ 35.36	250.0000	0.39744#
4	86.74/ 34.98	250.0000	0.39668#
5	85.51/ 25.79	500.0000	0.86750#
6	83.45/ 25.52	500.0000	0.84180#
7	80.15/ 15.18	1000.0000	1.97391#
8	76.77/ 14.21	1000.0000	2.04294#

CONTROL IT/IO = 53.44/ 95.42 52.52/ 92.72**

RATIOS = 0.5601 0.5664**

CORRECTION FACTOR = 0.5632

[illegible]

SSLOPE = 1.1692

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EC50

XX

100 1000 CONCENTRATION 10E4 10E

ECB 557-706

CONFIDENCE RANGE

STATISTICAL REPORT FOR DATA FILE N3188.K30

ESTIMATING EQUATION: $\text{LOG } C = 0.8541 \times \text{LOG } b + 2.7464$

NUMBER OF DATA PAIRS USED: 6

RESIDUAL VARIANCE: 0.00012

95% CONFIDENCE FACTOR: 1.02998 FOR EC50

CORRELATION COEFFICIENT: $R = 0.99932$ COEFFICIENT OF DETERMINATION: $R^2 = 0.99864$

EFFECTIVE CONCENTRATIONS (95% CONFIDENCE RANGE):

EC50 =	557.7067 mg/L	(	541.4752	TO	574.4247)
EC20 =	170.6819 mg/L	(	160.3766	TO	181.6493)***
EC10 =	85.3864 mg/L	(	77.6362	TO	93.9104)***
EC01 =	11.0138 mg/L	(	9.0374	TO	13.4225)***

*** EXTRAPOLATED RESULTS

INITIAL DATA

N3188.K30

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NUMBER	CONCENTRATION	GAMMA	% EFFECT	
1	125.0000	0.166	14.27	
2	125.0000	0.147	12.83	13.55
3	250.0000	0.397	28.44	
4	250.0000	0.397	28.40	28.42
5	500.0000	0.868	46.45	
6	500.0000	0.842	45.71	46.08
7	1000.0000	1.974	66.37	
8	1000.0000	2.043	67.14	66.76

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FINAL RESULTS

N3188.K30

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NUMBER	CONC.	GAMMA	GAMMA EST	% EFFECT
3	250.0000	0.3974	0.3913	28.440
4	250.0000	0.3967	0.3913	28.401
5	500.0000	0.8675	0.8800	46.453
6	500.0000	0.8418	0.8800	45.705
7	1000.0000	1.9739	1.9789	66.374
8	1000.0000	2.0429	1.9789	67.137

EC50 557.706 mg/L (95% CONFIDENCE RANGE 541.4752 TO 574.4247)

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