

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-3003. (1-Octanesulfonic acid) (CAS # 2795-39-3).

Remarks: The 3M production lot number was not given. The test sample is FC-3003. Current information indicates it is a mixture of 1% PFOS, 15% diethylene glycol butyl ether, 79.39% water, 2% Sultone foamer, 1.5% sodium octyl sulfate, 1% sodium decyl sulfate, 0.06% sodium lauryl sulfate, and 0.05% benzotriazole.

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: Static acute

GLP: No

Year Completed: 1997

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 1 g/L primary stock solution was prepared by dissolving 100 mg of test substance in 100 mL of Millipore Milli-Q™ water. The pH of the stock solution was then adjusted from 5.7 to 7.7 using 1.0 N NaOH. 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, 62.5, 125, 250, and 500 mg/L

Element value: 5-minute EC₅₀ = 311 (289 – 335) mg/L
 15-minute EC₅₀ = 171 (161 – 181) mg/L
 30-minute EC₅₀ = 120 (118 – 122) 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 30-minute EC₅₀ for *Photobacterium phosphoreum* was determined to be 120 mg/L with a 95% confidence interval of 118 to 122 mg/L.

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

DATA QUALITY

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

REFERENCES

This study was conducted by the 3M Environmental Laboratory, St. Paul, Minnesota, Lab Request number R1331, 1997.

OTHER

Last changed: 6/26/00.

ENVIRONMENTAL LABORATORY: MICROTOX PREP SHEET

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LR: R 1331Date: 3-13-97Analyst: TKS

SECOND RUN

TEST SUBSTANCE: FC-3003 AFFF (AUSTRALIA)

1. Preparation of Stock Solution

- * Mass/Vol. Test Substance: 100mg / 100 ml
- * Final Dilution Volume: 1g / L
- * Diluent: Milli-Q water
- * Final Concentration of Stock Solution: 1g / L

2. pH Adjustment of Stock Solution

- * Initial pH of Stock Solution: 5.7
- * pH Adjusted to: 7.7
- * pH Adjusted with: < 1 drop 1.0N NaOH

3. Osmotic Adjustment of Stock Solution

- * Osmotic Adjuster: NaCl
- * Comments: 10 ml of stock solution was added to 200 mg NaCl

4. Appearance of pH and Osmotically Adjusted Stock Solution

* CLEAR or OPAQUE (circle one)* Color: clear

* Comments: _____

5. Comments

MICROTOX DATA REPORT
Basic Test

FILE: R1331-2.K5

Second Run FC-3003 AFFF (Australia) 3-13-97 TKS

Test Time: 5 minutes

Osmotic Adjustment: NaCl

NUMBER	IO/IT	CONC.	CR/GAMMA	% EFFECT	AV % q DIFF.
Control	96.39/ 84.08	0.0	0.8723 #		
Control	98.56/ 83.21	0.0	0.8443 #		
1	93.56/ 70.36	62.5000	0.141 #	12.4	
2	92.15/ 70.94	62.5000	0.115 #	10.3	11.3 q 1.0
3	99.36/ 64.57	125.0000	0.321 #	24.3	
4	98.54/ 63.70	125.0000	0.328 #	24.7	24.5 q 0.2
5	94.67/ 48.38	250.0000	0.679 #	40.5	
6	94.86/ 47.57	250.0000	0.711 #	41.6	41.0 q 0.6
7	102.12/ 29.35	500.0000	1.986 #	66.5	
8	99.19/ 30.22	500.0000	1.817 #	64.5	65.5 q 1.0

CR = CoCORRECTION FACTOR = 0.8583

Used for calculations

EC50 311.0 mg/L (95% CONFIDENCE RANGE: 289.0 TO 334.7)

Signature Ludy Staphan

TEST DATE: 3-13-97
TIME: _____

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COEFFICIENT OF DETERMINATION: $R^2 = 0.99416$

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Run 2

MICROTOX DATA REPORT
Basic Test

FILE: R1331-2.K15

Second Run FC-3003 AFFF (Australia) 3-13-97 TKS

Test Time: 15 minutes

Osmotic Adjustment: NaCl

NUMBER	IO/IT	CONC.	CR/GAMMA	% EFFECT	AV % q DIFF.
Control	96.39/ 86.73	0.0	0.8998 #		
Control	98.56/ 87.78	0.0	0.8906 #		
1	93.56/ 64.20	62.5000	0.305	23.3	
2	92.15/ 65.29	62.5000	0.263	20.9	22.1 q 1.2
3	99.36/ 53.26	125.0000	0.670 #	40.1	
4	98.54/ 51.49	125.0000	0.713 #	41.6	40.9 q 0.8
5	94.67/ 32.83	250.0000	1.581 #	61.3	
6	94.86/ 33.21	250.0000	1.557 #	60.9	61.1 q 0.2
7	102.12/ 15.73	500.0000	4.812	82.8	
8	99.19/ 15.38	500.0000	4.773	82.7	82.7 q 0.1

CR = CoCORRECTION FACTOR = 0.8952

Used for calculations

EC50 170.8 mg/L (95% CONFIDENCE RANGE: 161.0 TO 181.2)

Signature *Judy Steffenhagen* TEST DATE: 3-13-97
TIME: _____

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Run 2

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EC50

10. XXXXXXXXXXXXXXXXXXXX XXXX XXXXXXXXXXXXXXXXXXXX XXXXXXXXXXXXXXXXXXXX

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100 CONCENTRATION 1000

10E4

ESTIMATING EQUATION: $\log C = 0.8430 \times \log b + 2.2325$

95% CONFIDENCE FACTOR: 1.06065 FOR EC50

COEFFICIENT OF DETERMINATION: $R^2 = 0.99691$

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TKS

RUN 2

MICROTOX DATA REPORT
Basic Test

FILE: R1331-2.K30

Second Run FC-3003 AFFF (Australia) 3-13-97 TKS

Test Time: 30 minutes

Osmotic Adjustment: NaCl

NUMBER	IO/IT	CONC.	CR/GAMMA	% EFFECT	AV % g DIFF.
Control	96.39/ 93.39	0.0	0.9689 #		
Control	98.56/ 93.35	0.0	0.9471 #		
1	93.56/ 62.39	62.5000	0.437	30.4	
2	92.15/ 62.84	62.5000	0.405 #	28.8	29.6 g 0.8
3	99.36/ 46.35	125.0000	1.054 #	51.3	
4	98.54/ 45.93	125.0000	1.055 #	51.3	51.3 g 0.0
5	94.67/ 26.50	250.0000	2.422	70.8	
6	94.86/ 26.61	250.0000	2.415	70.7	70.7 g 0.0
7	102.12/ 11.29	500.0000	7.665	88.5	
8	99.19/ 10.50	500.0000	8.050	89.0	88.7 g 0.2

CR = CoCORRECTION FACTOR = 0.9580

Used for calculations

EC50 120.3 mg/L (95% CONFIDENCE RANGE: 118.2 TO 122.4)

Signature Ludy Stiefel TEST DATE: 3-13-97
TIME: _____

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Tks

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10E4

COEFFICIENT OF DETERMINATION: R 2 = 0.99999