

MICROTOX® TOXICITY TEST

TEST SUBSTANCE

Identity: Perfluorooctanoic acid, ammonium salt; may also be referred to as PFOA ammonium salt, Ammonium perfluorooctanoate, FC-116, FC-126, FC-169, or FC-143. (Octanoic acid, pentadecafluoro-, ammonium salt, CAS # 3825-26-1)

Remarks: 3M production lot number 390. The test sample is FC-126, a white powdery solid. It's purity was not sufficiently characterized, though current information indicates it is a mixture of 78 - 93% test substance and 7 - 22% C₅, C₆, and C₇ perfluoro analogue compounds.

METHOD:

Method: Beckman's Microtox® "BASIC" Procedure

Test type: Static acute

GLP: No

Year Completed: 1987

Species: *Photobacterium phosphoreum*

Analytical monitoring: Light loss.

Exposure period: 30-minutes

Statistical methods: Not noted.

Test organism source: Not noted.

Test conditions:

Diluent: 2% NaCl Microbic's Reagent

Deionized water pH: 6.5

Stock and test solution preparation: A 2000 mg/L stock solution was prepared by dissolving 200 mg of the test solution in 100 mL diluent. Test solutions were prepared using aliquots of the stock solution.

Concentrations dosing rate: Once

Stability of the test chemical solutions: Not noted

Exposure vessels: Cuvettes.

Number of replicates: two

Number of concentrations: Four plus a blank control

RESULTS

Nominal concentrations: Blank control, 420, 560, 750, and 1000 mg/L

Element value:

- 5-minute EC₂₀ = 810 mg/L
- 5-minute EC₅₀ = >1000 mg/L
- 5-minute EC₈₀ = >1000 mg/L
- 15-minute EC₂₀ = 520 mg/L
- 15-minute EC₅₀ = >1000 mg/L
- 15-minute EC₈₀ = >1000 mg/L

30-minute EC₂₀ = 420 mg/L
30-minute EC₅₀ = 870 (810-930) mg/L
30-minute EC₈₀ = >1000 mg/L

All element values based on nominal concentrations.

CONCLUSIONS

The FC-126 30-minute EC₅₀ for *Photobacterium phosphoreum* was determined to be 870 mg/L with a 95% Confidence Interval of 810 to 930 mg/L.

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

DATA QUALITY

Reliability: Klimisch ranking 2. Testing meets all criteria for quality testing, but lacks analytical confirmation of test substance concentrations. There is a lack of characterization of the test sample.

REFERENCES

This study was conducted by the 3M Environmental Laboratory, St. Paul, Minnesota, Lab Request number E1282.

OTHER

Last changed: 5/24/00

LRE1282

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ENVIRONMENTAL LABORATORY
BECKMAN'S MICROTOX^R SYSTEM
MICROTOX^R RAW DATA

TEST SUBSTANCE: FC-126 Lot 390
TEST DATE: 4-29-87
ANALYST: Susan A. Beach

SAMPLE CUVETTE	FINAL ASSAY CONCENTRATION mg/L	INITIAL READING I(0)	FINAL READINGS		
			5-MIN. I(5)	15-MIN. I(15)	30-MIN I(30)
B1	BLANK CONTROL	90	89	89	87
C1	DUPLICATE	88	86	86	85
B2	420	93	83	76	69
C2	Duplicate	99	90	82	74
B3	560	95	83	74	66
C3	Duplicate	102	90	79	71
B4	760	101	83	69	58
C4	Duplicate	98	80	67	58
B5	1000	95	66	49	38
C5	Duplicate	96	70	49	38

Test Substance : Stock Soln. 200mg/100 ml 1 ml = 2 mg
(white powder) Appeared to dissolve completely
Initial pH = 5.7 Adjusted to 6.7 with dilute NaOH

Diluent : 2 % NaCl Microbics Reagent

Initial Dilutions: Initial concentrations were double the final assay concentrations mentioned above. The initial dilutions were introduced into the top row (Row A) and were then transferred (50/50) into the middle and the lower rows (Rows B + C).

DI Water Used: Distilled 4-20-87 pH = 6.5

BECKMAN'S MICROTOX^R SYSTEM

MICROTOX^R DATA REDUCTION

LR E 1282

Date 4-29-87

Analyst SAB

FC-126 Lot 390

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BLANK RATIOS* = $\frac{\text{Final}}{\text{Initial}}$

BLANK CUVETTE	5-MIN.		15-MIN.		30-MIN.	
	BLANK RATIO	DIFFERENCE	BLANK RATIO	DIFFERENCE	BLANK RATIO	DIFFERENCE
B1	87/90 = 0.989	0.012	87/90 = 0.989	0.012	87/90 = 0.967	0.001
C1	86/88 = 0.977		86/88 = 0.977		85/88 = 0.966	

See pg 1 for soil prep.

*The blank ratios for B1 and C1 should agree within 0.02.

MEAN BLANK RATIOS = $\frac{\text{B1 BK RATIO} + \text{C1 BK RATIO}}{2}$

5-MIN.	15-MIN.	30-MIN.
0.983	0.983	0.967

NORMALIZED LIGHT LOSS (I^{EFFECT}) = $\frac{\text{Mean Blank Ratio} \times \text{Initial Sample Reading}}{\text{Final Sample Reading}} - 1$

SAMPLE CUVETTE	5-MIN. I ^E	15-MIN. I ^E	30-MIN. I ^E
Test Concentration			
B2 420 mg/L	0.101	0.203	0.303
C2 420	0.081	0.187	0.294
B3 560	0.125	0.262	0.392
C3 560	0.114	0.269	0.389
B4 750	0.196	0.439	0.684
C4 750	0.204	0.438	0.634
B5 1000	0.415	0.906	1.418
C5 1000	0.348	0.926	1.443

% LIGHT LOSS (%Δ) = $\frac{I}{1+I} \times 100$

SAMPLE CUVETTE	5-MIN. %Δ	15-MIN. %Δ	30-MIN. %Δ
Test Concentration			
B2 420 mg/L	9.2	17	23
C2 420	7.5	16	23
B3 560	11	21	28
C3 560	10	21	28
B4 750	16	31	41
C4 750	17	30	39
B5 1000	29	48	59
C5 1000	26	48	59

EFFECTIVE CONCENTRATIONS (EC's) (Calculated using "I, C" data pairs.)

EC's	5-MIN.	15-MIN.	30-MIN.
EC ₂₀	810	520	420
EC ₅₀	1790 (1660-1940)	1100 (1050-1150)	870 (810-930)
EC ₈₀	3960	2330	> 1000