

ACTIVATED SLUDGE RESPIRATION INHIBITION TEST

TEST SUBSTANCE

Identity: A mixture containing perfluorooctanesulfonate, which may also be referred to as PFOS, FC-95, or as a component of FC-201F-X. (1-Octanesulfonic acid) (CAS # 2795-39-3).

Remarks: The 3M production lot number was 1. The test sample is FC-201F-X (F-11129). Current information indicates it is a mixture 3% PFOS, 36% diethylene glycol butyl ether, 36.6% water, 8.25% acrylic foamer, 7% sodium octyl sulfate, 6% sulfonated alkyl ether salts, 3% triethanolamine, and 0.15% toluotriazole.

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

METHOD

Method: OECD Guideline 209

GLP: No

Year Completed: 1992

Analytical monitoring: Dissolved oxygen concentrations, temperature.

Statistical methods: Not applicable.

Test organism source: Activated sludge mixed liquor collected from the Metro Wastewater Treatment Plant, St. Paul, MN

Test condition:

Dilution water: Millipore Milli-Q™ water

Synthetic sewage: per OECD method

Reference and test solution preparation: A 500 mg/L stock solution of the reference substance, 3,5-dichlorophenol, was prepared. The pH of the reference solution was measured to be 7.8. Test substance was added directly to the test vessels.

Test vessels: Not given

Number of concentrations: one plus blank controls, all in duplicate

Temperature: 17.7 – 19.0 °C

Total suspended solids and pH on day of testing: 3.4 g/L (TSS in final: 1.36 g/L. Initial pH 7.5 and final pH 7.5.

Element Basis: Respiration inhibition as determined by oxygen consumption.

Remarks: Uptake rates corrected to 20°C for calculations.

RESULTS

Nominal concentrations: Blank controls and 1000 mg/L, all in duplicate

Element values: 30-minute EC50 = >1000 mg/L

3-hour EC50 = >1000 mg/L

Element values based on nominal concentrations.

Remarks: Testing was conducted on a 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 3-hour EC₅₀ for activated sludge respiration inhibition was determined to be >1000 mg/L.

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

DATA QUALITY

Reliability: Klimisch ranking 3. Several pages are missing from this study. 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 Company, Environmental Laboratory, St. Paul, MN, Lab Request number K1126-1, 1992.

OTHER

Last changed: 6/26/00

ACTIVATED SLUDGE MIXED LIQUOR

Comments

Comments Brown Liquid

Comments

Comments _____

ENVIRONMENTAL LABORATORY

OECD ACTIVATED SLUDGE RESPIRATION INHIBITION TEST #209
 TEST SOLUTIONS PREPARATION

Test Substance: FC-201F-X F-11129 LOT 1

Sample Description: Brown Liquid

Analyst: KSN

Date: 3/23/92

Test Conc. mg/L	mg added per 500 mL	mL MQ(1) water per 500 mL	mL syn. sewage feed per 500 mL	mL microbial inoculum per 500 mL	Total Volume mL
<u>PK-CONTR</u>	<u>-</u>	<u>284</u>	<u>16</u>	<u>200</u>	<u>500</u>
<u>1000-A</u>	<u>500</u>	<u>284</u>	<u>16</u>	<u>200</u>	<u>500</u>
<u>1000-B</u>	<u>500</u>	<u>284</u>	<u>16</u>	<u>200</u>	<u>500</u>

INITIAL pH VALUES:

1000-A : 7.7

1000-B : 7.7

(1) Millipore Milli-Q^R high purity water

ENVIRONMENTAL LABORATORY
 OECD ACTIVATED SLUDGE RESPIRATION INHIBITION TEST #209
 CALCULATION OF RESULTS

Lr: K1126-1
 Date: 2/23/92

Test Substance: EC - 201F-X

Analyst: KSN

30-Minute Exposure

Dissolved Oxygen Concentrations, mg/L

mg/L	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	Temp, °C	R (1)	Ra (2)	% Inh. (3)
BK1	8.7	8.5	8.1	7.8	7.5	7.2	6.9	6.6	6.2	5.9	5.5	17.7	0.6473	0.7595	-
1000.00	2.7	2.4	1.9	1.4	0.9	0.4	-	-	-	-	-	18.5	1.0000	1.1099	0
1000.00	4.1	3.6	3.3	2.8	2.4	1.8	1.4	0.9	0.5	-	-	18.6	0.9000	0.9920	0
BK2	8.3	7.9	7.7	7.4	7.0	6.7	6.4	6.1	5.7	5.3	5.0	17.9	0.6594	0.7631	-

% diff in controls (4): 0.5

EC50 (95% CI): >1000 mg/L

RaCm (5): 0.7613

3-Hour Exposure

Dissolved Oxygen Concentrations, mg/L

mg/L	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	Temp, °C	R (1)	Ra (2)	% Inh. (3)
BK1	7.9	7.7	7.4	7.1	6.8	6.4	6.1	5.7	5.4	5.1	4.8	18.1	0.6582	0.7511	-
1000.00	8.3	8.0	7.6	7.3	6.8	6.3	5.9	5.4	5.1	4.7	4.3	19.0	0.8388	0.8992	0
1000.00	8.8	8.5	8.1	7.9	7.5	7.2	6.9	6.5	6.1	5.7	5.4	18.1	0.6909	0.7885	0
BK2	8.6	8.4	8.1	7.7	7.4	7.1	6.7	6.5	6.1	5.8	5.3	18.2	0.6679	0.7569	-

% diff in controls (4): 0.8

EC 50 (95% CI): >1000 mg/L

RaCm (5): 0.7540

(1) R= Oxygen uptake rate (mg O₂/L-min)

(2) Ra= R adjusted to 20°C= [R/θ.Ex]

(3) % Inhibition= [(RaCm)-RaS/(RaCm)]100

(4) % difference in controls: [(RaBk1-RaBk2)/RaCm]100 (Two controls must be within 15% of each other.)

(5) Mean adjusted R controls= [RaBk1+RaBk2]/2

θ= 1.072

RaCm= mean adjusted R, controls

Bk= blank control, S= sample

Tobs= sample temp

x= Tobs-20°C