ACTIVATED SLUDGE RESPIRATION INHIBITION TEST

TEST SUBSTANCE

Identity: Perfluorodecanesulfonate, ammonium salt; may also be referred to as PFDS, FC-121-X, or 3M Sample E2112 and E2566-1. (1-Decanesulfonic acid, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,10-heneicosafluoro-, ammonium salt, CAS # 67906-42-7)

Remarks: Test sample is a mixture of the test substance in water and 2-propanol, 1-(1,1-dimethylethoxy). This mixture contains approximately 22-26% test substance, 33-37% propanol, 1-(1,1-dimethylethoxy), 0.5-1.5% perfluorononanesulfonate, ammonium salt and 38-42% water). All values reported relate to this mixture. No calculations were made to adjust for the actual concentration of the test substance in the test sample. Test material was from 3M production lot 1.

Note: Only the summary page was available for this study

METHOD

Method: OECD 209
Test type: Static acute
GLP: No
Year Completed: 1987
Analytical monitoring: Dissolved oxygen concentrations.
Exposure Period: 30-minutes and 3-hours
Measurements: Dissolved oxygen depletion rate after 30-minutes and 3-hours of exposure.

RESULTS

Nominal concentrations: Blank control, 100, 180, 320, 560, 1000 mg/L, in duplicate.
Element value: 30-min EC_{50} > 1000 mg/L
3-hour EC_{50} = 780 (630-1050) mg/L

All element values based on nominal concentrations.

Statistical method: Probit analysis

Control response: The largest percent difference between control uptake rates was 7.5%; thus the two controls were within 15% of each other.

Reference substance results: Not available
Remarks: Testing was conducted on the "as-sold" mixture of the subject material (~22-26% subject substance in water). The value reported applies to that mixture and not the test material. No attempt was made to determine the impact of the presence of the organic solvents or what portion of the toxicity can be contributed to the perfluorodecanesulfonate.

CONCLUSIONS

The 3-hour EC_{50} for FC-121 was determined to be 780 (630 – 1050) mg/L

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

DATA QUALITY

Reliability: Klimisch ranking 4. Most of the supporting material for this study is missing. Because a mixture was tested, care must be taken when interpreting the results. The solvent in the mixture could have enhanced or restricted biological uptake and/or toxicity of the fluorochemical component. The study lacked analytical confirmation of concentrations and characterization of the sample purity.

REFERENCES

This study was conducted by the 3M Company, Environmental Laboratory, St Paul, MN, Lab Request numberE2112, 10/30/87

OTHER

Last changed: 5/18/00

ENVIRONMENTAL LABORATORY

ACTIVATED SLUDGE RESPIRATION INHIBITION TEST #209
CALCULATION OF RESULTS

LR E2112
Date 10-30-87
Analyst SAB

Pg 3 of 3

Test Substance EC-121-X (41-2601-0429-8 Lot 1) FC Surfactant

30 - MINUTE EXPOSURE

Test Substance Concentration (mg/L)	Oxygen Uptake Rate R	R Corrected[1] to 20°C	% Inhibition in Respiration Rate[2]
CONTROL I	0.4776	0.4776	—
100	0.4248	0.4248	13
180	0.4297	0.4297	12
320	0.4273	0.4273	13
560	0.3721	0.3721	24
1000	0.3642	0.3642	25
CONTROL II	0.5000	0.5000	—

Percent Difference in Controls[3] 4.6%

EC_{50} (95% Confidence Limits) mg/L >1000 mg/L

3 - HOUR EXPOSURE

Test Substance Concentration (mg/L)	Oxygen Uptake Rate R	R Corrected[1] to 20°C	% Inhibition in Respiration Rate[2]
CONTROL I	0.5067	0.5067	—
100	0.5127	0.4897	7.0
180	0.4218	0.4218	20
320	0.4127	0.4127	23
560	0.3255	0.3285	38
1000	0.2091	0.2091	60
CONTROL II	~~0.5795~~ 0.5461	0.5461	—

SAB 10-30-87

Percent Difference in Controls[3] 7.5%

EC_{50} (95% Confidence Limits) mg/L 780 (630-1050) mg/L Probit Analysis

(1) Temp. Correction = $\frac{R_{T,obs}}{\theta^{X}}$ (mg O_2/L-min.)

(2) % Inhibition = $\frac{\left(\frac{RC_1 + RC_2}{2}\right) - R_S}{\left(\frac{RC_1 + RC_2}{2}\right)} \times 100$

(3) % Difference = $\frac{|RC_1 - RC_2|}{\left(\frac{RC_1 + RC_2}{2}\right)} \times 100$

The two control respiration rates should be within 15% of each other

See pg 1 for test soln. prep

Where:
R = Oxygen uptake rate (mg O_2/L-min.)
T,obs = Sample temp., C°
θ = 1.047; X = T,obs - 20°C
C = Control

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