

BIODEGRADATION (BOD/COD)

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, identified by the laboratory as R1331. 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 degradation of the fluorochemical component of the test sample.

METHOD:

Method: OECD Guideline.

Type: Aerobic

GLP: No

Year completed: 1997

Contact time: 28 days

Inoculum: Polyseed NX, Lot D257, Polybac Corporation, Bethlehem, PA

RESULTS

Chemical Oxygen Demand (COD): 377,000 mg/kg

Biochemical Oxygen Demand (CBOD):

5-Day: 132,000 mg/kg

10-Day: 247,000 mg/kg

20-Day: 296,000 mg/kg

28-Day: 368,000 mg/kg

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

No conclusions given.

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

DATA QUALITY

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

REFERENCES

This test was conducted by ASci Corporation, Duluth Environmental Testing Division, Duluth, MN at the request of the 3M Company, Lab Request number R1331, 1997.

OTHER

Last changed: 6/26/00

AScl Corporation/AScl-Duluth
Environmental Testing Division
Submitted to 3M Company - 8/97
AScl-DETD Study ID #5010-068

R1331 BOD REPORT FOR 3M COMPANY

Submitted to

**3M Environmental Technology and Safety Services
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Prepared by

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AUGUST 1997

COD = 377,000 mg O₂ / kg chemical.

Dates of BOD test: 7/18/97 - 8/15/97.

Water bath temperature range during the test: 19.8 - 20.6°C.

Lot number of Polyseed NX: D257.

TABLE 1. BOD Dilution Information for R1331

Sample ID (mg/L)	Stock Solution Concentration (mg/L)	Sample Volume (ml)	Sample Concentration (mg/L)
10	1000.0	3	10
18	1000.0	5.4	18
25	1000.0	7.5	25
50	1000.0	15	50

TABLE 2. BOD Blank Calculations for R1331

Sample ID	Day	FIRST REPLICATE			SECOND REPLICATE		
		Initial D.O.	Final D.O.	D.O. Drop	Initial D.O.	Final D.O.	D.O. Drop
Blank	5	8.90	8.84	0.06	8.91	8.90	0.01
Blank	10	8.90	8.45	0.45	8.91	8.42	0.49...
Blank	20	8.90	8.30	0.60	8.91	8.42	0.49...
Blank	28	8.90	8.43	0.47	8.91	8.29	0.62...

TABLE 3. BOD Seed Correction Factor Calculations for R1331

Seed Conc. ml/Bottle	Day	FIRST REPLICATE				SECOND REPLICATE				Average SCF
		Initial D.O.	Final D.O.	D.O. Drop	SCF ^a	Initial D.O.	Final D.O.	D.O. Drop	SCF	
10	5	8.85	5.40	3.45	0.69	8.90	5.35	3.37	0.67	0.68
10	10	8.85	1.89	6.96	1.39	8.90	2.40	6.50	1.30	1.35
10	20	8.85	0.98	7.87	1.57	8.90	<0.5	--	--	1.57
10	28	8.85	0.72	8.13	1.63	8.90	0.64	8.26	1.65	1.64

^a SCF = (D.O. drop * ml seed in test) / ml seed in seed blank.

TABLE 4. BOD Reference^a and Tox Blanks Calculations for R1331

Conc. mg/L	Day	SCF	FIRST REPLICATE					SECOND REPLICATE				
			Initial D.O.	Final D.O.	D.O. Drop	Corrected Drop	BOD mg/L ^b	Initial D.O.	Final D.O.	D.O. Drop	Corrected Drop	BOD mg/L
0	5	0.68	8.94	4.04	4.90	4.22	211	8.90	4.40	4.50	3.82	191
50	5	0.68	8.98	<0.5	8.48	7.80	>390	8.95	<0.5	8.45	7.77	>389

^a Reference = 150 mg glucose and 150 mg glutamic acid in 1 liter BOD dilution water, tested at 2% dilution.

^b BOD mg/L = (corrected D.O. drop) * 300 ml BOD volume / 6 ml reference.

TABLE 5. BOD Calculations for R1331

Conc. mg/L	Day	SCF	FIRST REPLICATE					SECOND REPLICATE				
			Initial D.O.	Final D.O.	D.O. Drop	Corrected Drop	BOD mg/kg ^a	Initial D.O.	Final D.O.	D.O. Drop	Corrected Drop	BOD mg/kg
10	5	0.68	8.94	6.32	2.62	1.94	--	8.90	7.10	1.80	1.12	--
18	5	0.68	8.90	7.00	1.90	1.22	--	8.91	6.74	2.17	1.49	--
25	5	0.68	8.91	3.64	5.27	4.59	184,000	8.92	6.70	2.22	1.54	--
50	5	0.68	8.95	3.20	5.75	5.07	101,000	8.95	1.65	7.30	6.62	132,000
			Mean 143,000					Mean 132,000				
10	10	1.35	8.94	5.42	3.52	2.17	217,000	8.90	4.96	3.94	2.56	259,000
18	10	1.35	8.90	3.24	5.66	4.31	239,000	8.91	3.27	5.64	4.29	238,000
25	10	1.35	8.91	1.72	7.19	5.84	234,000	8.92	1.50	7.42	6.07	243,600
50	10	1.35	8.95	<0.5	8.45	7.10	>142,000	8.95	<0.5	8.45	7.10	>142,000
			Mean 230,000					Mean 247,000				
10	20	1.57	8.94	4.50	4.44	2.87	287,000	8.90	3.75	5.15	3.58	358,000
18	20	1.57	8.90	2.12	6.78	5.21	289,000	8.91	2.54	6.37	4.80	267,000
25	20	1.57	8.91	0.72	8.19	6.62	265,000	8.92	0.74	8.18	6.61	264,000
50	20	1.57	8.95	<0.5	--	--	--	8.95	<0.5	--	--	--
			Mean 280,000					Mean 296,000				
10	28	1.64	8.94	4.00	4.94	3.30	330,000	8.90	3.12	5.78	4.14	414,000
18	28	1.64	8.90	2.12	6.78	5.14	286,000	8.91	1.47	7.44	5.80	322,000
25	28	1.64	8.91	<0.5	--	--	--	8.92	<0.5	--	--	--
50	28	1.64	8.95	<0.5	--	--	--	8.95	<0.5	--	--	--
			Mean 308,000					Mean 368,000				

^a BOD = corrected drop x 1,000,000 / test concentration.

Omitted data points: D.O. drop corrected for SCF too low (<2.0).
Final D.O. <0.5 mg/L.