St. Paul, MN 55144-1000
651 733 1110

MR 280349

3M

October 26, 2004

8EHQ-1004-15981

[redacted]

By Hand Delivery
Document Processing Center (7407)
Office of Pollution, Prevention and Toxics
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, N. W.
Washington, DC 20460
Attention: Section 8(e) Coordinator

Re: **TSCA Section 8(e) Submissions**

Dear Sir/Madam:

3M Company ("3M") requests that EPA place the attached studies in the TSCA Section 8(e) docket. We have included a master index for these studies identifying the study title, test substance and CAS number. A Confidential Business Information (CBI) version of this index and the studies also is being submitted today pursuant to EPA procedures. 3M has not provided CBI substantiation with this submission, but would be willing to do so at the Agency's request.

3M has concluded that data in these studies may not be, strictly speaking, "corroborative" of previously reported or published information as defined in EPA's reporting guidance or otherwise potentially may warrant 8(e) submission based on EPA's reporting guidance.

3M appreciates EPA's attention to this matter. Please contact the undersigned if you have any questions or require further information regarding this submission.

Very truly yours,

8EHQ-05-15981

Katherine E. Reed (9.7.)

Dr. Katherine E. Reed, Ph.D
Staff Vice President
Environmental Technology and Safety Services
(651) 778-4331
kereed@mmm.com

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Master Index to Studies Submitted Under TSCA 8(e) by 3M Company on October 26, 2004
(Confidential Business Information Redacted)

Title	Substance Information	CAS Information
Aquatic Toxicity Data Sheet: 48hr *Daphnia Magna*	1,4-dioxane; heptadecafluoro-1-octanesulfonic acid; linear n-ethyl perfluorooctanesulfonamide; n-ethylperfluorooctanesulfonamidoethyl alcohol; poly(oxy-1,2-ethanediyl), .alpha.-[2-[ethyl[(heptadecafluorooctyl)sulfonyl]amino]ethyl]-.omega.-hydroxy-; poly(oxy-1,2-ethanediyl), .alpha.-[2-[ethyl[(nonafluorobutyl)sulfonyl]amino]ethyl]-.omega.-hydroxy-; poly(oxy-1,2-ethanediyl), .alpha.-[2-[ethyl[(pentadecafluoroheptyl)sulfonyl]amino]ethyl]-.omega.-hydroxy-; poly(oxy-1,2-ethanediyl), .alpha.-[2-[ethyl[(tridecafluorohexyl)sulfonyl]amino]ethyl]-.omega.-hydroxy-; poly(oxy-1,2-ethanediyl), .alpha.-[2-[ethyl[(undecafluoropentyl)sulfonyl]amino]ethyl]-.omega.-hydroxy-; polyethylene glycol; water	1,4-dioxane (123-91-1); heptadecafluoro-1-octanesulfonic acid (1763-23-1); linear n-ethyl perfluorooctanesulfonamide (4151-50-2); n-ethylperfluorooctanesulfonamidoethyl alcohol (1691-99-2); poly(oxy-1,2-ethanediyl), .alpha.-[2-[ethyl[(heptadecafluorooctyl)sulfonyl]amino]ethyl]-.omega.-hydroxy- (29117-08-6); poly(oxy-1,2-ethanediyl), .alpha.-[2-[ethyl[(nonafluorobutyl)sulfonyl]amino]ethyl]-.omega.-hydroxy- (68298-79-3); poly(oxy-1,2-ethanediyl), .alpha.-[2-[ethyl[(pentadecafluoroheptyl)sulfonyl]amino]ethyl]-.omega.-hydroxy- (68298-81-7); poly(oxy-1,2-ethanediyl), .alpha.-[2-[ethyl[(tridecafluorohexyl)sulfonyl]amino]ethyl]-.omega.-hydroxy- (56372-23-7); poly(oxy-1,2-ethanediyl), .alpha.-[2-[ethyl[(undecafluoropentyl)sulfonyl]amino]ethyl]-.omega.-hydroxy- (68298-80-6); polyethylene glycol (25322-68-3); water (7732-18-5)
Multigeneration Daphnid Life Cycle Test	1,4-dioxane; heptadecafluoro-1-octanesulfonic acid; linear n-ethyl perfluorooctanesulfonamide; n-ethylperfluorooctanesulfonamidoethyl alcohol; poly(oxy-1,2-ethanediyl), .alpha.-[2-[ethyl[(heptadecafluorooctyl)sulfonyl]amino]ethyl]-.omega.-hydroxy-; poly(oxy-1,2-ethanediyl), .alpha.-[2-[ethyl[(nonafluorobutyl)sulfonyl]amino]ethyl]-.omega.-hydroxy-; poly(oxy-1,2-ethanediyl), .alpha.-[2-[ethyl[(pentadecafluoroheptyl)sulfonyl]amino]ethyl]-.omega.-hydroxy-; poly(oxy-1,2-ethanediyl), .alpha.-[2-[ethyl[(tridecafluorohexyl)sulfonyl]amino]ethyl]-.omega.-hydroxy-; poly(oxy-1,2-ethanediyl), .alpha.-[2-[ethyl[(undecafluoropentyl)sulfonyl]amino]ethyl]-.omega.-hydroxy-; polyethylene glycol; water	1,4-dioxane (123-91-1); heptadecafluoro-1-octanesulfonic acid (1763-23-1); linear n-ethyl perfluorooctanesulfonamide (4151-50-2); n-ethylperfluorooctanesulfonamidoethyl alcohol (1691-99-2); poly(oxy-1,2-ethanediyl), .alpha.-[2-[ethyl[(heptadecafluorooctyl)sulfonyl]amino]ethyl]-.omega.-hydroxy- (29117-08-6); poly(oxy-1,2-ethanediyl), .alpha.-[2-[ethyl[(nonafluorobutyl)sulfonyl]amino]ethyl]-.omega.-hydroxy- (68298-79-3); poly(oxy-1,2-ethanediyl), .alpha.-[2-[ethyl[(pentadecafluoroheptyl)sulfonyl]amino]ethyl]-.omega.-hydroxy- (68298-81-7); poly(oxy-1,2-ethanediyl), .alpha.-[2-[ethyl[(tridecafluorohexyl)sulfonyl]amino]ethyl]-.omega.-hydroxy- (56372-23-7); poly(oxy-1,2-ethanediyl), .alpha.-[2-[ethyl[(undecafluoropentyl)sulfonyl]amino]ethyl]-.omega.-hydroxy- (68298-80-6); polyethylene glycol (25322-68-3); water (7732-18-5)
Aquatic Invertebrate Testing - Alkyltins LR 8024-1	Alkyltins: dibutyltin laurate and dibutyltin-di(2 ethylhexoate)	Dibutyltin laurate (CAS 77-58-7); Dibutyltin-di(2 ethylhexoate) (CAS 2781-10-4)
Aquatic Invertebrate Testing - Decosheen Material (LR-8052)	Decosheen Ribbon Materials and pigments: Decosheen Blue in Green Ceres Blue ZV; Decosheen Gold Paste Pigment; Decosheen Royal Blue, Solvent Blue	Decosheen Blue in Green Ceres Blue ZV (CAS 61814-09-3); Decosheen Royal Blue, Solvent Blue [illegible]-86-6); Decosheen Gold Paste Pigment (CAS Number [illegible]
R Scratch Remover (Fathead Minnow)	55-65% Water; 20-30% Stoddard Solvent; 1-5% Sodium Silicate; 1-5% Potassium Hydroxide; 0.1-3% Nonylphenoxypoly(oxyethylene)ethanol	Water (CAS 7732-18-5); [illegible] Solvent (CAS 8052-41-3); Sodium Silicate (CAS 1344-09-8); Potassium Hydroxide (CAS 1310-58-3); Nonylphenoxypoly(oxyethylene)ethanol (CAS 9016-45-9)
S Scratch Remover (Fathead Minnow)	60-70% Water; 20-30% Stoddard Solvent; 1-5% Sodium Silicate; 0.1-3% Turgitol NP-33	Water (CAS 7732-18-5); Stoddard Solvent (CAS 8052-41-3); Sodium Silicate (CAS 1344-09-8); Turgitol NP-33 (CAS 9016-45-9)
Octanol Water Partition Coefficient	N-methylperfluorooctane sulfonamidoethanol	CAS 24448-09-7

COMPANY SANITIZED

Master Index to Studies Submitted Under TSCA 8(e) by 3M Company on October 26, 2004
(Confidential Business Information Redacted)

Title	Substance Information	CAS Information
CoCl2.6H2O as Co2+ Toxicity to Microtox Reagent	Cobalt (as Co2+ ion) (CoCl2.6H2O)	CAS 7791-13-1
Activated Sludge Respiration Inhibition Test on CoCl2.6H2O as Co ion	Cobalt (as Co2+ ion) (CoCl2.6H2O)	CAS 7791-13-1
Acute Toxicity of CoCl2.6H20 as Co ion to Daphnia magna under Static Exposure Conditions	Cobalt (as Co2+ ion) (CoCl2.6H2O)	CAS 7791-13-1
Acute Toxicity of CoCl2.6H20 as Co ion to Fathead Minnow under Static Exposure Conditions	Cobalt (as Co2+ ion) (CoCl2.6H2O)	CAS 7791-13-1
Freshwater Algae Growth Inhibition Test	Cobalt (as Co2+ ion) (CoCl2.6H2O)	CAS 7791-13-1
Daphnia magna 21-Day Chronic Reproduction Study	N-ethylperfluorooctane sulfonamidoethanol	CAS 1691-99-2
Plant Growth Effects of [ ]	[ ]	[ ]
Final Report (*Daphnia* and Microtox)	Monomethyl ether of hydroquinone	CAS 150-76-5
Microtox Test Results	2 Ethylhexyl Acrylate; Isooctyl Acrylate Monomer; 2-Methylbutyl acrylate; Methyl isoamyl acrylate; Isooctyl Acrylate	2 Ethylhexyl Acrylate (CAS 103-11-7); Isooctyl Acrylate Monomer (CAS 29590-42-9) 2-Methylbutyl acrylate (CAS 44914-03-6); Methyl isoamyl acrylate (CAS 18993-92-1); Isooctyl Acrylate (CAS 29590-42-9)
Phytotoxicity Test Results	[ ]	[ ]

Master Index to Studies Submitted Under TSCA 8(e) by 3M Company on October 26, 2004
(Confidential Business Information Redacted)

Title	Substance Information	CAS Information
Plant Toxicity Comparison, Young Seedling Growth	[ ]	[ ]
Ceriodaphnia dubia Survival and Reproduction exposed to Opequon Creek Water Spiked with BETZ 1110 Polymer (November 4, 1987 sample) for seven days under static renewal conditions	BETZ 1110: Non-3M Product - Chemical composition not provided to 3M by manufacturer	MSDS provided by manufacturer states product is "not hazardous" and not "considered to be a carcinogen"
Ceriodaphnia dubia Survival and Reproduction exposed to Opequon Creek Water Spiked with Betz 1138 Polymer (November 4, 1987 sample) for seven days under static renewal conditions	BETZ 1138: Non-3M Product - Chemical composition not provided to 3M by manufacturer	MSDS provided by manufacturer states product is "not hazardous" and not "considered to be a carcinogen"
Toxicity of 1,6 - Hexanediol Diacrylate to *Daphnia magna*	1,6 Hexanediol diacrylate	CAS 13048-33-4
Daphnia magna Chronic Bioassay Under Static Renewal Conditions	Methyl isoamyl acrylate	CAS 18993-92-1
Estimating the Chronic Toxicity of Nalclear 7177 to *Ceriodaphnia* Survival and Reproduction Using Short-Term Tests	Nalclear 7177 wastewater treatment acrylamide/acrylate polymer - Chemical composition not provided to 3M by manufacturer	CAS Information not provided to 3M by manufacturer
Acute Toxicity of Isooctyl Acrylate to *Daphnia magna*	Isooctyl Acrylate Monomer	CAS 29590-42-9
Static Acute Toxicity of [ ] to the Daphnid, *Daphnia magna*	Tolyltriazole	CAS 29385-43-1
Static Acute Toxicity of [ ] to the Alga, *Selenastrum capricornutum*	Tolyltriazole	CAS 29385-43-1
Static Acute Toxicity of [ ] to the Daphnid, *Daphnia magna*	[ ]	[ ]
Static Acute Toxicity of [ ] to the Fathead Minnow, *Pimephales promelas*	[ ]	[ ]
Static Acute Toxicity of [ ] to the Daphnid, *Daphnia magna*	water; propylene-tetrafluoroethylene polymer; tert-butyl alcohol	water (7732-18-5); propylene-tetrafluoroethylene polymer (27029-05-6); tert-butyl alcohol (75-65-0)

Master Index to Studies Submitted Under TSCA 8(e) by 3M Company on October 26, 2004
(Confidential Business Information Redacted)

Title	Substance Information	CAS Information
Isooctyl acrylate: Fish, Acute Toxicity Test	Isooctyl Acrylate Monomer	CAS 29590-42-9
Isooctyl Acrylate: *Daphnia sp.* Acute Immobilization Test	Isooctyl Acrylate Monomer	CAS 29590-42-9
Isooctyl Acrylate: Alga, Growth Inhibition Test	Isooctyl Acrylate Monomer	CAS 29590-42-9
Isooctyl Acrylate: *Daphnia sp*. Reproduction Test	Isooctyl Acrylate Monomer	CAS 29590-42-9
Acute Toxicity of [ ] to the mysid, *Mysidopsis bahia*	[ ]	[ ]
Final Report (Microtox)	[ ]	[ ]
Determination of the Partition Coefficient (N-Octanol/Water) of T-5896 by High Performance Liquid Chromatography (HPLC)	N-methyl perfluorooctane sulfonamido ethanol; N-methyl perfluorooctane sulfonamidethyl acrylate	N-methyl perfluorooctane sulfonamido ethanol (CAS 25268-77-3); N-methyl perfluorooctane sulfonamidethyl acrylate (CAS 24448-09-7)
OECD Activated Sludge Respiration Inhibition Test Results	N-Dodecyltrimethylammonium chloride	CAS = 112-00-5
Final Report (Fish Acute Toxicity)	Mirataine CB (30% Cocamidopropyl betaine = Amides, coco, N-(3-(dimethylamino)propyl), alkylation products with chloroacetic acid, sodium salts, 70% Water and Inerts); Mirataine COB (30% Coco/Oleamidopropyl Betaine = 1-Propanaminium, 3-amino-N-(carboxymethyl)-N,N-dimethyl-, N-coco acyl derivs., inner salt)	Cocamidopropyl betaine (CAS 70851-07-9); Coco/Oleamidopropyl Betaine (CAS 61789-40-0)
A Flow-Through Life-Cycle Toxicity Test With the Saltwater Mysid (*Mysidopsis bahia*)	Perfluorooctane sulfonate	CAS 1763-23-1
Lithium: Alga, Acute toxicity Tests	Lithium Chloride	CAS 7447-41-8
An Early Life-Stage Toxicity Test With the Fathead Minnow (*Pimephales promelas*)	Perfluorooctane sulfonate	CAS 1763-23-1
Lithium: Fish, Acute toxicity Tests	Lithium Chloride	CAS 7447-41-8
Lithium: *Daphnia*, Acute toxicity Tests	Lithium Chloride	CAS 7447-41-8
Summary of Toxicity Testing on OSCI and OSF	Octane sulfonyl chloride and Octane sulfonyl fluoride	Octane sulfonyl fluoride (CAS 7795-95-1), Octane sulfonyl chloride (CAS 4063-63-5)
Toxicity to Microtox Test	Lauryldimethylamineoxide	CAS 1643-20-5

Master Index to Studies Submitted Under TSCA 8(e) by 3M Company on October 26, 2004
(Confidential Business Information Redacted)

Title	Substance Information	CAS Information
Ecotoxicological Testing of CoCl2.6H2O as Co2+ ion (Seed Germination and Root Elongation)	Cobalt (as Co2+ ion) (CoCl2.6H2O)	CAS 7791-13-1

11/15/94
SAB

ENVIRONMENTAL LABORATORY

OECD ACTIVATED SLUDGE RESPIRATION INHIBITION TEST RESULTS

Cationic Surfactants, Lab Request M2990

PERCENT INHIBITION IN RESPIRATION RATE

Test Conc. mg/L	M2990-1 n-Dodecyl 30-min	M2990-1 n-Dodecyl 3-Hr	M2990-2 n-Octyl 30-min	M2990-2 n-Octyl 3-Hr
5.0	0	0		
50	25	52		
100			16	34
500	80	91	37	63
1000			34	65
EC50	140	52	> 1000	280
95% C.I.	89-220	39-71	-	170-420

LR M2990-1
Date 11/14/94
Analyst RW
Page 1 of 4

ENVIRONMENTAL LABORATORY

ACTIVATED SLUDGE MIXED LIQUOR

Type Test OECD Activated Sludge Respiration Inhibition TST #209

ACTIVATED SLUDGE MIXED LIQUOR

Date Obtained 11/14/94 Date Used 11/14/94

Mixed Liquor Suspended Solids (MLSS) 4.4 g/L Adjusted to — g/L

MLSS in final test solution 1.8 g/L

Initial pH 6.6 (1st test soln. prepared) Final pH 6.6 (last soln. prepared)

Comments

TEST SUBSTANCE

Sample Description N-Decanol

Initial pH of highest conc. tested (500 mg/L) = 7.1 Adjusted to pH —

Comments

REFERENCE SUBSTANCE

Sample Description 3,4-Dichlorobenzoic acid

Initial pH of stock solution (500 mg/L) = 7.6 Adjusted to pH —

Comments

EXPOSURE CONDITIONS

Test Duration 3 hr

Test Temperature Range: 19.2 - 19.5 °C

Comments

LR M 2990-1
PG 244

ENVIRONMENTAL LABORATORY

OECD ACTIVATED SLUDGE RESPIRATION INHIBITION TEST #209
TEST SOLUTIONS PREPARATION

Test Substance: n- Dodecyl

Sample Description: Clear, somewhat viscous liquid

Analyst: SAB / JBD

Date: 11/19/99

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
Blank Controls	—	294	16	300	500
5.0	2.5	↓	↓	↓	↓
50	25				
500	250				

Initial pH higher than target, see note

(1) Millipore Milli-Q[R] high purity water

LR M2990-1
Pg 3 of 4

ENVIRONMENTAL LABORATORY

OECD ACTIVATED SLUDGE RESPIRATION INHIBITION TEST #209

RAW DATA

Test Substance: n-Dodecyl

Source of Activated Sludge Mixed Liquor: Metro Wastewater Treatment Plant St. Paul, MN

Date Received: 11-14-94 Date Used: 11-14-94

Analyst: JED/AB/RW

30-MINUTE EXPOSURE DISSOLVED OXYGEN CONCENTRATIONS, mg/L

Test Substance Concentration (mg/L)	TIME-MINUTES 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	Temp °C
BK CONTROL I	7.3	7.0	6.7	6.5	6.2	6.0	5.7	5.5	5.3	5.0	4.7	18.7
5.0	7.2	6.7	6.3	6.0	5.7	5.3	5.1	4.8	4.5	4.2	3.9	19.5
50.0	7.5	7.3	7.2	7.0	6.7	6.5	6.4	6.2	6.0	5.8	5.7	18.3
500.0	8.5	8.5	8.6	8.8	8.4	8.4	8.4	8.3	8.2	8.1	8.1	18.4
BK CONTROL II	7.3	7.5	7.2	7.0	6.8	6.5	6.3	6.0	5.8	5.6	5.4	18.5

3-HOUR EXPOSURE DISSOLVED OXYGEN CONCENTRATIONS, mg/L

Test Substance Concentration (mg/L)	TIME - MINUTES 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	Temp °C
BK CONTROL I	7.0	7.9	7.2	6.9	6.7	6.7	6.2	5.1	5.7	5.7	5.5	18.2
5.0	6.9	6.8	6.4	6.1	5.8	5.[illegible]	5.4	4.9	4.7	4.5	4.2	19.3
50.0	8.3	8.2	8.1	8.2	7.9	7.7	7.6	7.4	7.3	7.2	7.1	18.3
500.0	9.1	9.1	9.1	9.0	9.0	9.0	9.0	8.9	8.9	8.9	8.9	18.2
BK CONTROL II	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

pH of activated sludge mixed liquor: Initial 6.6 Final 6.6
pH of highest concentration tested: Initial [illegible] Final 7.7
Test temperature: [illegible]

Pg 4 of 4

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

LR: M2990-1
Date: 11/14/94

Test Substance: n-Dodecyl

Analyst(s): SAB/JBD/RJW

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	7.3	7.0	6.7	6.5	6.2	6.0	5.7	5.5	5.3	5.0	4.7	18.7	0.4970	0.5440	
5.0	7.2	6.7	6.3	6.0	5.7	5.3	5.1	4.8	4.5	4.2	3.9	19.5	0.6097	0.6313	0
50	7.5	7.3	7.2	7.0	6.7	6.5	6.4	6.2	6.0	5.9	5.7	18.8	0.3657	0.3975	25
500	8.5	8.5	8.5	8.5	8.4	8.4	8.4	8.3	8.2	8.1	8.1	18.8	0.0994	0.1080	80
BK2	7.8	7.5	7.2	7.0	6.8	6.5	6.3	6.0	5.8	5.6	5.4	18.5	0.4691	0.5207	

% diff in controls (4): 4.4 — EC50 (95% CI): 140 (89 - 220) mg/L — RaCm (5): 0.5323

EC50 Estimation Method: TSK: 20% trim

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	7.6	7.4	7.2	6.9	6.7	6.4	6.2	5.9	5.7	5.4	5.2	18.2	0.4970	0.5632	
5.0	6.9	6.8	6.4	6.1	5.8	5.5	5.4	4.9	4.7	4.5	4.2	19.3	0.5636	0.5917	0
50	8.3	8.2	8.1	8.0	7.9	7.7	7.6	7.4	7.3	7.2	7.1	18.7	0.2582	0.2826	52
500	9.1	9.1	9.1	9.0	9.0	9.0	9.0	8.9	8.9	8.9	8.9	18.8	0.0485	0.0527	91
BK2	7.6	7.4	7.1	6.8	6.5	6.2	6.0	5.6	5.4	5.1	4.9	18.6	0.5624	0.6199	

% diff in controls (4): 9.6 — EC 50 (95% CI): 52 (39 - 71) mg/L — RaCm (5): 0.5916

EC50 Estimation Method: TSK: 9 % trim

(1) R= Oxygen uptake rate (mg O2/L min)
(2) Ra= R adjusted to 20 C= [R/a Ea]
(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

a= 1.072
RaCm= mean adjusted R, controls
Bk= blank control, S= sample
Tobs= sample temp
x= Tobs-20°C

LRM2990-1+2
Pg 1 of 3

ENVIRNOMENTAL LABORATORY

OECD ACTIVATED SLUDGE RESPIRATION INHIBITION TEST # 209
TEST SOLUTIONS PREPARATION

Test Substance: 3,5 Dichlorophenol Reference Substance

Sample Description: Aldrich Red Label, Lot 00410KZ

Analyst: S+B / JBD

Date: 11/14/94

Stock Solution Preparation: 500 mg/L Each 1.0 mL = 0.5 mg
- Dissolved 500 mg 3,5 DCP in 10 mL 1.0 N NaOH
- Diluted to 30 mL with Milli-Q water
- Added [illegible] N H_2SO_4 dilution under stirring until [illegible] ppt
- Diluted to one liter with Milli-Q water
Stock solution pH: 7.6

Test Conc. mg/L	mL 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
Blank Controls	–	234	16	200	500
10	10	234	16	200	500

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

LR M2990-1&2
Pg 2 of 3

ENVIRONMENTAL LABORATORY

OECD ACTIVATED SLUDGE RESPIRATION INHIBITION TEST #209

RAW DATA

Test Substance: 3,5-Dichlorophenol

Source of Activated Sludge Mixed Liquor: [illegible] Treatment Plant, St. Paul, MN

Date Received: 11-14-94

Date Used: 11-14-94

Analyst: JBD/[illegible]/RJW

30-MINUTE EXPOSURE DISSOLVED OXYGEN CONCENTRATIONS, mg/L

Test Substance Concentration (mg/L)	TIME-MINUTES 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	Temp °C
BK CONTROL I	7.3	7.0	6.7	6.5	6.2	6.0	5.7	5.5	5.3	5.0	4.7	18.7
10	7.9	7.7	7.5	7.2	7.0	6.8	6.5	6.0	5.9	5.5	5.4	19.2
BK CONTROL II	7.8	7.5	[illegible]	[illegible]	6.8	6.5	6.3	6.0	5.8	5.6	5.4	[illegible]

3-HOUR EXPOSURE DISSOLVED OXYGEN CONCENTRATIONS, mg/L

Test Substance Concentration (mg/L)	TIME - MINUTES 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	Temp °C
BK CONTROL I	7.6	7.9	7.2	6.9	6.7	6.4	6.2	5.9	5.7	5.4	5.2	18.2
10	8.5	8.4	[illegible]	8.1	8.0	7.9	7.8	7.6	7.5	7.4	7.2	19.6
BK CONTROL II	7.6	7.4	7.1	6.8	6.5	6.2	[illegible]	[illegible]	5.4	5.1	4.9	[illegible]

pH of activated sludge mixed liquor: Initial 6.6 Final [illegible]
pH of highest concentration tested: Initial [illegible] Final [illegible]
Test temperature: [illegible]

Pg 3 of 3

M2990-1&2
11/14/94

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

Test Substance: 3,5-Dichlorophenol

Analyst(s): SAB/JBD/RJW

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	7.3	7.0	6.7	6.5	6.2	6.0	5.7	5.5	5.3	5.0	4.7	18.7	0.4970	0.5440	
10	7.9	7.7	7.5	7.2	7.0	6.8	6.5	6.0	5.9	5.5	5.4	19.2	0.5394	0.5702	0
BK2	7.8	7.5	7.2	7.0	6.8	6.5	6.3	6.0	5.8	5.6	5.4	18.5	0.4691	0.5207	

RaCm (5): 0.5323

% diff in controls (4): 4.4

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	7.6	7.4	7.2	6.9	6.7	6.4	6.2	5.9	5.7	5.4	5.2	18.2	0.4970	0.5632	
10	8.5	8.4	8.2	8.1	8.0	7.9	7.8	7.6	7.5	7.4	7.2	19.6	0.2509	0.2580	56
BK2	7.6	7.4	7.1	6.8	6.5	6.2	6.0	5.6	5.4	5.1	4.9	18.6	0.5624	0.6199	

RaCm (5): 0.5916

% diff in controls (4): 9.6

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

(2) Ra= R adjusted to 20°C= [R/e 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

e= 1.072
RaCm= mean adjusted R, controls
Bk= blank control, S= sample
Tobs= sample temp
x= Tobs-20 C

LR M2990-1 PW
Date 10/27/94
Analyst PW
Page 1 of 10

ENVIRONMENTAL LABORATORY

ACTIVATED SLUDGE MIXED LIQUOR

Type Test: OECD ACTIVATED SLUDGE RESPIRATION INHIBITION, # 209

ACTIVATED SLUDGE MIXED LIQUOR

Date Obtained 10/24/94 Date Used 10/27/94

Mixed Liquor Suspended Solids (MLSS) 3.7 g/L Adjusted to — g/L

MLSS in final test solution 1.48 g/L

Initial pH 6.9 (1st test soln. prepared) Final pH 6.8 (last soln. prepared)

Comments

TEST SUBSTANCE

Sample Description D-Dec[illegible]

Initial pH of highest conc. tested (500 mg/L) = 6.6 Adjusted to pH —

Comments

REFERENCE SUBSTANCE

Sample Description 3,5 Dichlorophenol

Initial pH of stock solution (500 mg/L) = 6.6 Adjusted to pH 7.3

Comments pH Adjusted with 10 Drops 1.0 N NaOH

EXPOSURE CONDITIONS

Test Duration 3 Hours

Test Temperature Range: [illegible] C

Comments

LR M2990-1
Pg 2 of 10

ENVIRONMENTAL LABORATORY

OECD ACTIVATED SLUDGE RESPIRATION INHIBITION TEST #209
TEST SOLUTIONS PREPARATION

Test Substance: n-Dodecyl

Sample Description: Clear colorless, viscous liquid, miscible with water

Analyst: JBD

Date: 10-27-94

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
Controls	–	284	16	200	500
10	5	284	16	200	500
50	25	284	16	200	500
100	50	284	16	200	500
500	250	284	16	200	500

Init. pH highest conc. tested = 6.6.

(1) Millipore Milli-Q® high purity water

LR ma990-1
Pg 3 of 10

ENVIRONMENTAL LABORATORY

CEOD ACTIVATED SLUDGE RESPIRATION INHIBITION TEST #209

RAW DATA

Test Substance: n-Dodecyl

Source of Activated Sludge Mixed Liquor: Metropolitan Wastewater Treatment Plant, St. Paul, MN.

Date Used: 10-27-94

Date Received: 10/24/94

Analyst: RBW/MAS

30-MINUTE EXPOSURE — DISSOLVED OXYGEN CONCENTRATIONS, mg/L

Test Substance Concentration (mg/L)	TIME-MINUTES 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	Temp °C
BK CONTROL I	7.6	7.6	7.4	7.2	6.9	6.7	6.4	6.2	5.9	5.7	5.4	19.7
1C	6.7	6.5	6.2	5.9	5.6	5.3	4.9	4.5	4.3	3.9	3.7	19.7
5C	7.1	6.8	6.6	6.4	6.2	6.0	5.8	5.5	5.3	5.1	5.0	19.8
10C	7.0	6.7	6.6	6.4	6.3	6.2	6.0	5.8	5.8	5.7	5.5	19.5
50C	8.6	8.5	8.5	8.5	8.5	8.4	8.4	8.3	8.3	8.2	8.2	19.4
BK CONTROL II	7.6	7.4	6.9	6.7	6.3	6.1	5.8	5.4	5.1	4.8	4.5	18.8

3-HOUR EXPOSURE — DISSOLVED OXYGEN CONCENTRATIONS, mg/L

Test Substance Concentration (mg/L)	TIME - MINUTES 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	Temp °C
BK CONTROL I	7.0	6.5	6.2	5.6	5.3	4.8	4.3	3.9	3.3	3.0	2.5	18.5
1C	6.9	6.5	6.0	5.6	5.2	4.7	4.3	4.0	3.5	3.1	2.7	19.1
5C	6.9	6.5	6.2	5.9	5.7	5.4	5.1	4.7	4.4	4.2	3.8	18.7
10C	8.1	7.9	7.7	7.4	7.1	6.8	6.5	6.5	6.3	6.1	5.9	18.6
50C	9.1	9.2	9.2	9.2	9.0	9.0	9.0	9.0	9.0	9.0	9.0	18.8
BK CONTROL II	6.7	6.2	5.7	5.1	4.4	3.8	3.2	2.8	2.2	1.6	1.1	19.0

LR: M2990-1
Date: 10/27/94
Pg 4 of 10

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

Test Substance: n-Dodecyl

Analyst(s): JBD/RJW

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	7.6	7.6	7.4	7.2	6.9	6.7	6.4	6.2	5.9	5.7	5.4	19.7	0.4921	0.5025	0
10.0	6.7	6.5	6.2	5.8	5.6	5.3	4.9	4.5	4.3	3.9	3.7	19.7	0.6364	0.6498	0
50	7.1	6.8	6.8	6.4	6.2	6.0	5.8	5.5	5.3	5.1	5.0	19.8	0.4182	0.4240	28
100	7.0	6.7	6.6	6.4	6.3	6.2	6.0	5.8	5.8	5.7	5.5	19.5	0.2642	0.2736	54
500	8.6	8.5	8.5	8.5	8.5	8.4	8.4	8.3	8.3	8.2	8.2	19.4	0.0776	0.0809	86
BK2	7.6	7.4	6.9	6.7	6.3	6.1	5.8	5.4	5.1	4.8	4.5	18.8	0.6279	0.6825	0

RaCm (5): 0.5925

% diff in controls (4): 30.4

EC50 (95% CI):

EC50 Estimation Method: TSK: 20% trim

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	7.0	6.5	6.2	5.6	5.3	4.8	4.3	3.9	3.3	3.0	2.5	18.5	0.9042	1.0036	0
10.0	6.8	6.5	6.0	5.6	5.2	4.7	4.3	4.0	3.5	3.1	2.7	19.1	0.8364	0.8904	20
50	6.9	6.5	6.2	5.9	5.7	5.4	5.1	4.7	4.4	4.2	3.8	18.7	0.5952	0.6514	42
100	8.1	7.9	7.7	7.4	7.1	6.9	6.8	6.5	6.3	6.1	5.9	18.6	0.4436	0.4890	56
500	9.1	9.2	9.2	9.2	9.0	9.0	9.0	9.0	9.0	9.0	9.0	18.8	0.0509	0.0553	95
BK2	6.8	6.2	5.7	5.1	4.4	3.8	3.2	2.8	2.2	1.6	1.1	19.0	1.1455	1.2279	0

RaCm (5): 1.1158

% diff in controls (4): 20.1

EC 50 (95% CI):

EC50 Estimation Method: TSK; 9 % trim

(1) R= Oxygen uptake rate (mg O2/L-min)
(2) Ra= R adjusted to 20°C= (R/e.Es)
(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

e= 1.072
RaCm= mean adjusted R, controls
Bk= blank control, S= sample
Tobs= sample temp
Es= Tobs-20°C

SUMMARY

LR M 2990-1
pg 2 of 4

ENVIRONMENTAL LABORATORY

OECD ACTIVATED SLUDGE RESPIRATION INHIBITION TEST #209
TEST SOLUTIONS PREPARATION

Test Substance: n-dodecyl

Sample Description: Clear, [illegible] liquid

Analyst: JBD

Date: 9-29-94

Test Conc. mg/L	mg added per 500 mL	mL MO(1) water per 500 mL	mL syn. sewage feed per 500 mL	mL microbial inoculum per 500 mL	Total Volume mL
[illegible]	—	284	16	200	500
50	25				
100	50				
500	250				
1000	500				

Initial pH of highest conc. [illegible] = 7.1

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

LR M 2990-1
Pg 3 of 4

ENVIRONMENTAL LABORATORY

OECD ACTIVATED SLUDGE RESPIRATION INHIBITION TEST #209

RAW DATA

Test Substance: n-Dodecyl

Source of Activated Sludge Mixed Liquor: Metro Waste Treatment Plant St Paul, MN

Date Received: 9/29/94

Date Used: 9/29/94

Analyst: SHB | KW

30-MINUTE EXPOSURE — DISSOLVED OXYGEN CONCENTRATIONS, mg/L

Test Substance Concentration (mg/L)	TIME-MINUTES 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	Temp °C
BK CONTROL II	8.2	8.0	7.8	7.6	7.4	7.1	7.0	6.8	6.6	6.4	6.2	19.1
50	8.4	8.3	8.2	8.1	7.9	7.8	7.7	7.5	7.4	7.2	7.1	18.3
100	8.3	8.2	8.1	8.0	7.9	7.8	7.7	7.6	7.4	7.3	7.2	18.5
500	8.6	8.6	8.6	8.6	8.7	8.6	8.6	8.6	8.6	8.6	8.5	19.0
1000	8.8	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	18.6
BK CONTROL III	7.1	6.9	6.7	6.5	6.3	6.1	5.9	5.6	5.4	5.2	5.0	19.1

3-HOUR EXPOSURE — DISSOLVED OXYGEN CONCENTRATIONS, mg/L

Test Substance Concentration (mg/L)	TIME - MINUTES 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	Temp °C
BK CONTROL II	8.9	8.6	8.4	8.2	8.0	7.8	7.7	7.5	7.3	7.1	7.0	18.5
50	9.0	9.0	8.9	8.8	8.7	8.7	8.6	8.7	[illegible]	[illegible]	[illegible]	[illegible]
100	9.1	8.9	8.8	8.7	8.8	8.8	8.7	8.7	8.6	[illegible]	[illegible]	[illegible]
500	9.1	9.0	9.0	8.9	8.9	8.8	9.0	8.9	8.8	[illegible]	[illegible]	[illegible]
1000	9.3	9.1	9.1	9.0	9.1	9.1	9.1	9.1	9.1	9.1	[illegible]	[illegible]
BK CONTROL III	8.4	8.3	8.1	8.0	7.8	7.7	7.6	[illegible]	7.4	7.4	7.4	[illegible]

pH of activated sludge mixed liquor: Initial 6.2 Final 6.5

pH of highest concentration tested: Initial 6.5 Final

Test temperature: 18.2 - 19.1 °C

Lr: M2990-1

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

Date: 9/29/94

Test Substance: n-Dodecyl

Analyst: SAB/RJW/JBD

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	8.2	8.0	7.8	7.6	7.4	7.1	7.0	6.8	6.6	6.4	6.2	19.1	0.3988	0.4245	
50	8.4	8.3	8.2	8.1	7.9	7.8	7.7	7.5	7.4	7.2	7.1	18.3	0.2643	0.2974	32.5
100	8.3	8.2	8.1	8.0	7.9	7.8	7.7	7.6	7.4	7.3	7.2	18.5	0.2255	0.2502	43.2
500	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.5	19.0	0.0109	0.0117	97.3
1000	8.8	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	18.6	0.0000	0.0000	100.0
BK2	7.1	6.9	6.7	6.5	6.3	6.1	5.9	5.6	5.4	5.2	5.0	19.1	0.4291	0.4568	

% diff in controls (4): 7.3 EC50(95% C.I.): 9.3 (25-240) mg/L Probit Analysis RaCm (5): 0.4407

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	8.9	8.6	8.4	8.2	8.0	7.8	7.7	7.5	7.3	7.1	7.0	18.5	0.3588	0.3982	
50	9.0	9.0	8.9	8.8	8.8	8.7	8.6	8.6	8.5	8.4	8.3	18.2	0.1400	0.1587	61.5
100	9.1	8.9	8.9	8.9	8.8	8.8	8.7	8.7	8.5	8.5	8.5	18.7	0.1067	0.1168	71.7
500	9.1	9.0	9.0	8.9	8.9	8.9	9.0	8.9	8.9	8.9	8.9	19.0	0.0182	0.0195	95.3
1000	9.3	9.1	9.1	9.1	9.1	9.1	9.1	9.1	9.1	9.1	9.1	18.9	0.0000	0.0000	100.0
BK2	8.4	8.3	8.1	8.0	7.8	7.7	7.5	7.3	7.1	6.9	6.4	18.5	0.3842	0.4265	

% diff in controls (4): 6.9 EC50(95% C.I.): 36 (22-41) mg/L Probit Analysis RaCm (5): 0.4124

(1) R= Oxygen uptake rate (mg O2/L-min)
(2) Ra= R adjusted to 20°C= [R/e.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

e= 1.072
RaCm= mean adjusted R controls
Bk= blank control, Ra= sample
Tobs= sample temp
t= Tobs-20°C

Pg 4 of 4

EPA PROBIT ANALYSIS PROGRAM
USED FOR CALCULATING EC VALUES
Version [illegible]

OECD 209 Act. Sludg. Resp. 30-min 3exp. n-Dodecyl LR [illegible] [illegible]

Conc.	Number Exposed	Number Resp.	Observed Proportion Responding	Adjusted Proportion Responding	Predicted Proportion Responding
[illegible]	100	[illegible]	0.3300	[illegible]	0.2601
100.0000	100	[illegible]	0.4300	[illegible]	0.5304
500.0000	100	[illegible]	0.9780	[illegible]	[illegible]
1000.0000	100	[illegible]	1.0000	[illegible]	[illegible]

[illegible] Square Heterogeneity [illegible]

WARNING

[illegible]

OECD 209 Act. Sludg. Resp. 30-min Beep. n-Dodecyl LR M2990-1 9/29/94 sat

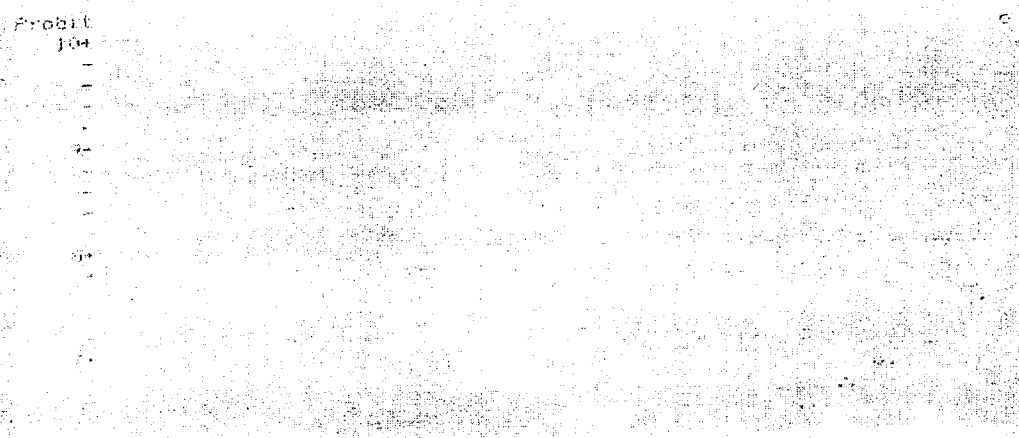
Estimated EC Values and Confidence Limits

Point	Conc.	Lower 95% Confidence Limits	Upper 95% Confidence Limits
EC 1.00	9.8742	0.0015	31.4[illegible]
EC 5.00	19.0404	0.0306	47.1[illegible]
EC10.00	27.0224	0.1318	60.1[illegible]
EC15.00	34.2251	0.4417	[illegible]
EC30.00	93.9120	25.2938	[illegible]
EC85.00	252.2[illegible]	12[illegible]	[illegible]
EC90.00	[illegible]	[illegible]	[illegible]
EC95.00	453.4[illegible]	196.1[illegible]	12487[illegible]
EC99.00	874.3[illegible]	[illegible]	2565210.[illegible]

$EC_{50} = 93\ (25 - 240)\ mg/L$

OECD 209 Act. Sludg. Resp. 30-min Sexp. n-Dodecyl LR M2990-1 9/29/94 sat

PLOT OF ADJUSTED PROBITS AND PREDICTED REGRESSION LINE



EPA PROBIT ANALYSIS PROGRAM
USED FOR CALCULATING EC VALUES
Version 1.4

OECD Law Act. Study: Resp. Inhib 3-hr exp [illegible] CR M2790-1 9/29/94
[illegible]

Conc.	Number Exposed	Number Resp.	Observed Proportion Responding	Adjusted Proportion Responding	Predicted Proportion Responding
50.0000	100	[illegible]	[illegible]	0.5200	0.5081
100.0000	100	72	0.7200	0.7200	0.7544
500.0000	100	95	0.9500	0.9500	0.9615
1000.0000	100	100	1.0000	1.0000	0.9872

Chi Square Heterogeneity = [illegible]

[illegible] = 1.564420 [illegible]
Slope = [illegible]

Parameter	Estimate	Std. Err.	95% Confidence Limits	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Slope	[illegible]	[illegible]	[illegible]	1.949[illegible]

Theoretical Spontaneous Response [illegible]

OECD 209 Act. Sludg. Resp. Inhib. 3hr exp n-Dodecyl LR M2990-1 9/29/94
sab

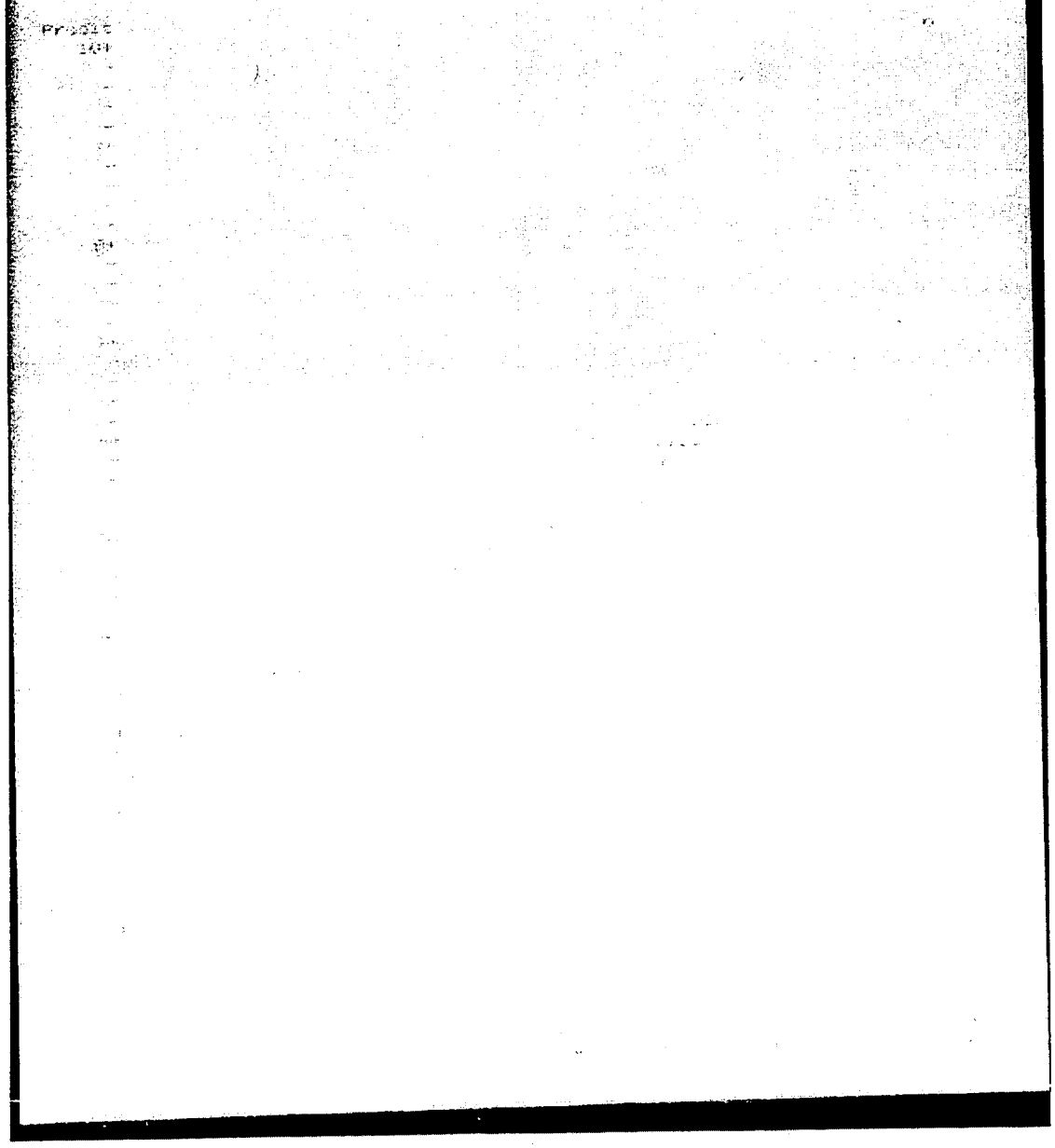
Estimated EC Values and Confidence Limits

Point	Conc.	Lower 95% Confidence Limits	Upper 95% Confidence Limits
EC 1.00	1.1180	0.2174	2.9428
EC 5.00	3.0871	0.8550	6.6266
EC10.00	5.3000	1.7717	10.2339
EC15.00	7.6469	2.8924	13.7398
EC50.00	35.8443	22.3320	49.1043
EC85.00	168.0184	130.2677	251.4112
EC90.00	245.1545	182.3422	363.8170
EC95.00	416.1814	289.9972	731.8937
EC99.00	1149.2780	667.2437	2815.3845

$EC_{50} = 36\ (22-49)\ mg/L$

OECD 209 Act. Sludg. Resp. Tabl. 3-hr exp. n-Dodecyl LR [illegible] 9/29/94
sab

PLOT OF ADJUSTED PROBLEM AND PREDICTED REGRESSION LINE



LR m 2490-1
Date 9/26/94
Analyst SHB
Page 1 of 4

ENVIRONMENTAL LABORATORY

ACTIVATED SLUDGE MIXED LIQUOR

Type Test OECD Activated Sludge Respiration Inhibition #209

ACTIVATED SLUDGE MIXED LIQUOR

Date Obtained 9/26/94 Date Used 9/26/94

Mixed Liquor Suspended Solids (MLSS) 2.65 g/L Adjusted to — g/L

MLSS in final test solution 1.06 g/L

Initial pH 6.6 (1st test soln. prepared) Final pH 6.4 (last soln. prepared)

Comments

TEST SUBSTANCE

Sample Description n-Dodecyl

Initial pH of highest conc. tested (100 mg/L) = 7.3 Adjusted to pH —

Comments

REFERENCE SUBSTANCE

Sample Description 3,5-Dichlorophenol

Initial pH of stock solution (500 mg/L) = 7.6 Adjusted to pH —

Comments

EXPOSURE CONDITIONS

Test Duration 3-4 days

Test Temperature Range: 16.9-19.4 °C

Comments

LR M 2490-1
Pg 2 of 4

ENVIRONMENTAL LABORATORY

OECD ACTIVATED SLUDGE RESPIRATION INHIBITION TEST #209
TEST SOLUTIONS PREPARATION

Test Substance: n-Dodecyl

Sample Description: Clear, somewhat viscous liquid

Analyst: SAB

Date: 9/26/94

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
[illegible]	–	284	10	200	500
1000	500	↓	↓	↓	↓
Duplicate	500	↓	↓	↓	↓

Initial test solution pH = 7.3 prior [illegible] to microbial [illegible] addition

No pH adjustment made

(1) Millipore Milli-Q® high purity water

LR M2990-1

pg 3 of 4

ENVIRONMENTAL LABORATORY

OECD ACTIVATED SLUDGE RESPIRATION INHIBITION TEST #209

RAW DATA

Test Substance: n-Dodecyl

Source of Activated Sludge Mixed Liquor: Metro Waste Treatment Plant St Paul, MN

Date Received: 9/26/94 Date Used: 9/26/94

Analyst: SAB

30-MINUTE EXPOSURE DISSOLVED OXYGEN CONCENTRATIONS, mg/L

Test Substance Concentration (mg/L)	TIME-MINUTES 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	Temp °C
BK CONTROL I	8.4	8.3	8.1	8.0	7.8	7.7	7.5	7.3	7.2	7.0	6.9	18.7
1000 mg/L	9.0	8.9	8.9	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	19.4
Duplicate	8.9	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.7	8.2	8.7	19.6
BK CONTROL II	8.7	8.7	8.6	8.5	8.4	8.2	8.1	7.9	7.8	7.7	7.6	17.2

3-HOUR EXPOSURE DISSOLVED OXYGEN CONCENTRATIONS, mg/L

Test Substance Concentration (mg/L)	TIME - MINUTES 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	Temp °C
BK CONTROL I	8.8	8.8	8.7	8.7	8.6	8.5	8.4	8.3	8.2	8.1	8.0	17.3
1000	9.1	9.1	9.1	9.1	9.1	9.1	9.1	9.1	9.1	9.1	9.1	18.4
Duplicate	9.2	9.3	9.2	9.3	9.3	9.3	9.3	9.3	9.3	9.2	9.3	17.7
BK CONTROL II	8.9	8.9	8.9	8.8	8.7	8.6	8.6	8.5	8.4	8.3	8.2	16.9

pH of activated sludge mixed liquor: Initial 6.6 Final 6.4

pH of highest concentration tested: Initial 6.9 Final 7.1

Test temperature: 17-19.4°C

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

Lr: M2990-1

Date: 9/26/94

Pg 4 of 4

Test Substance: n-Dodecyl

Analyst: SAB

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	8.4	8.3	8.1	8.0	7.8	7.7	7.5	7.3	7.2	7.0	6.9	18.7	0.3152	0.3450	
1000	9.0	8.9	8.9	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	19.4	0.0357	0.0372	88.7
1000	8.9	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.7	8.8	8.7	19.0	0.0170	0.0182	94.5
BK2	8.7	8.7	8.6	8.5	8.4	8.2	8.1	7.9	7.8	7.7	7.6	17.2	0.2582	0.3137	

% diff in controls (4): 9.5 EC50(95% C.I.): <1000 mg/L RaCm (5): 0.3293

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	8.8	8.8	8.7	8.7	8.6	8.5	8.4	8.3	8.2	8.1	8.0	17.3	0.1806	0.2179	
1000	9.1	9.1	9.1	9.1	9.1	9.1	9.1	9.1	9.1	9.1	9.1	18.4	0.0000	0.0000	100.0
1000	9.2	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.2	9.2	17.7	0.0194	0.0228	89.0
BK2	8.9	8.9	8.9	8.8	8.7	8.6	8.6	8.5	8.4	8.3	8.2	16.9	0.1588	0.1970	

% diff in controls (4): 10.1 EC50(95% C.I.): <1000 mg/L RaCm (5): 0.2074

(1) R= Oxygen uptake rate (mg O2/L-min)
(2) Ra= R adjusted to 20°C= [R/e Es]
(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

e= 1.072
RaCm= mean adjusted R, controls
Bk= blank control, S= sample
Tobs= sample temp
t= Tobs-20°C

11/17/1994 ENVIRONMENTAL LABORATORY FINAL REPORT

LAB REQUEST NO. M2990
REQUESTOR NAME: SB STRAND/KIM JOHNSON
DEPARTMENT: 3058
PROJECT NO: B120100300
DATE RECEIVED: 09/14/1994
DESC: CATIONIC SURFACTANTS

CONTRACT LAB(S):
EXP COMP DATE: 10/17/1994
DATE COMPLETED: 11/17/1994
PROJECT LEAD: SA BEACH
PHONE NO: 612-778-7452
3M FAX NO: 612-778-6176

Sample one is C12Me3N+Cl- in IPA/H2O. Wt% surfactant cation = 59%.
Sample two is C8Me3N+Me2EO4- aqu. Wt% surfactant cation = 40.5%.
Activated sludge respiration Inhibition test results:

Percent inhibition in respiration rate after 30-min. exposure:

n-Dodecyl test conc. mg/L	% inhib	n-Octyl test conc. mg/L	% inhib.
5.0	0	100	16
50	25	500	37
500	80	1000	34

Percent inhibition in respiration rate after 3-hours exposure:

n-Dodecyl Test conc. mg/L	% inhib	n-Octyl Test conc. mg/L	% inhib
5.0	0	100	34
50	52	500	[illegible]
500	91	1000	[illegible]

SAMPLE	DATE	CODE	DESCRIPTION	RESULT	[illegible]
1		n-Dodecyl	Cloudy liq.		
		SLUDGE RESPIRATION - EC50		52 MG/L	(39 - [illegible])
2		n-Octyl	Cloudy liq.		
		SLUDGE RESPIRATION - EC50		285 MG/L	([illegible] - 420)

Project Lead Review: _____ Date: _____