MICROBICS MICROTOX® TOXICITY TEST

TEST SUBSTANCE

Identity: Mixture containing perfluorooctanesulfonate which may also be referred to as PFOS, FC-95, or as a component of FC-3017. (1-Octanesulfonic acid) (CAS # 2795-39-3).

Remarks: The 3M production lot number was not noted. The test sample is FC-3017. Current information indicates FC-3017 is a mixture of 0.67% PFOS, 20% diethylene glycol butyl ether, 55.41% water, 21% ethylene glycol, 1.33% Hydroxy foamer, 1% sodium octyl sulfate, 0.5% polyoxyethylene monooctylphenyl ether, 0.04% sodium lauryl sulfate, and 0.05% tolyltraizole.

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

METHOD:

Method: Microbics Microtox® "BASIC" Procedure
Test type: Acute static
GLP: No
Year Completed: 1995
Species: *Photobacterium phosphoreum*
Analytical monitoring: pH and osmotic condition.
Exposure period: 30-minutes
Statistical methods: EC50 values calculated by statistical linear regression program provided for Microtox®
Test organism source: Microbics' Reagent.
Test conditions:

Diluent: Millipore Milli-Q™ water
Test temperature: Not noted.
Stock and test solution preparation: A 2000 mg/L primary stock solution was prepared by dissolving 200 mg of test substance in 100 mL of Millipore Milli-Q™ water. The pH of the stock solution was 6.0, and an osmotic adjustment was made using 200 mg NaCl dissolved in 10 mL stock solution. Appearance of test solutions was noted as "clear". All test solutions were made by proportional dilutions.
Exposure vessels: 4 mL cuvettes.
Number of replicates: two
Number of concentrations: Four plus a blank control
Element basis: Percent light loss

RESULTS

Nominal concentrations: Blank control, 125, 250, 500, and 1000 mg/L

Element value: 5-minute EC_{50} = >1000 mg/L
15-minute EC_{50} = 785 (728 – 846) mg/L
30-minute EC_{50} = 558 (541 – 574) mg/L

Element values based on nominal concentrations.

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

The test substance 15-minute EC_{50} for *Photobacterium phosphoreum* was determined to be 558 mg/L with a 95% confidence interval of 541 to 574 mg/L.

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

DATA QUALITY

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

REFERENCES

This study was conducted by the 3M Environmental Laboratory, St. Paul, MN, Lab Request number N3188, 1995.

OTHER

Last changed: 6/26/00.

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pH-FIC

ENVIRONMENTAL LABORATORY: MICROTOX PREP SHEET

LR: N[illegible]
Date: 1/26/95
Analyst: [illegible]

TEST SUBSTANCE: FC-3017

1. Preparation of Stock Solution

* *Mass/Vol. Test Substance:* 200mg/100mL
* *Final Dilution Volume:* 2gIL
* *Diluent:* [illegible]

* Final Concentration of Stock Solution: 2g/L

2. pH Adjustment of Stock Solution

* *Initial pH of Stock Solution:* 6.0
* *pH Adjusted to:* —
* *pH Adjusted with:* —

3. Osmotic Adjustment of Stock Solution

* *Osmotic Adjuster:* NaCl
* *Comments:* Added 10mL of 2g/L stock solution for 200mg NaCl

4. Appearance of pH and Osmotically Adjusted Stock Solution

* *CLEAR or OPAQUE (circle one)*
* *Color:* —
* *Comments:*

5. Comments

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MICROTOX DATA REPORT

FILE NAME: N3108.K5

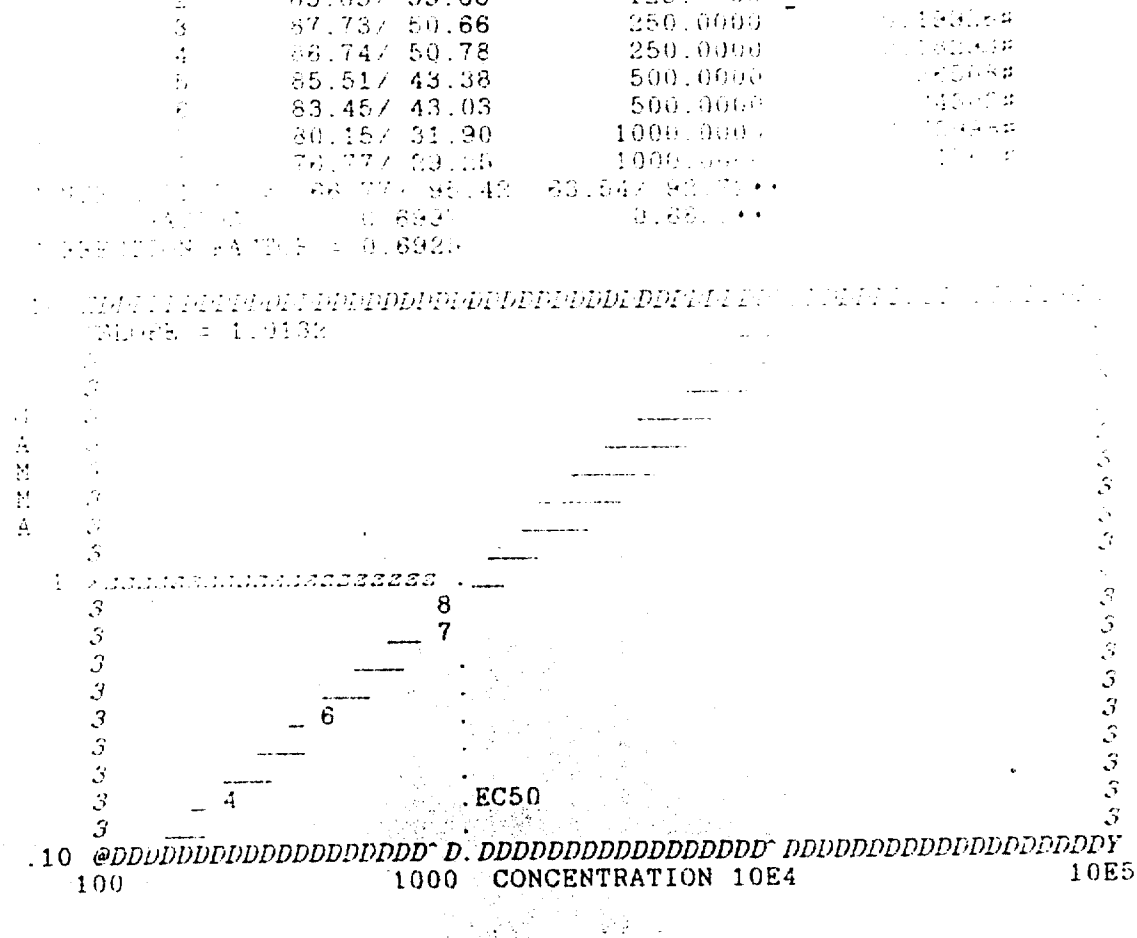
TEST DATE: 9/26/95
TEST TIME: 10:30 AM

Investigator: GWT
Sample Description: FC-3017
Procedure: BASIC
Initial Concentration : 1000 mg/L
Test Time: 5 minutes

Osmotic Adjustment: Not
Dilution Factor:
Concentration Units: mg/

NUMBER	I0/IT	CONC.	GAMMA
1	86.13/ 55.50	125.0000	0.[illegible]
2	85.85/ 55.86	125.0000	0.[illegible]
3	87.73/ 50.66	250.0000	[illegible]#
4	86.74/ 50.78	250.0000	[illegible]#
5	85.51/ 43.38	500.0000	[illegible]#
6	83.45/ 43.03	500.0000	[illegible]#
[illegible]	80.15/ 31.90	1000.000[illegible]	[illegible]#
[illegible]	78.77/ 29.15	1000.000[illegible]	[illegible]
[illegible]	88.77/ 98.42	83.54/ 92.71**	
[illegible]	0.8837	0.86[illegible]**	

[illegible] = 0.6920



EC501304.9501 (95% CONFIDENCE RANGE:1116.0963 TO 1525.7596)

Used for calculations

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STATISTICAL REPORT FOR DATA FILE N31[illegible].RS

ESTIMATING EQUATION: LOG C = 0.9769 x LOG D +5.1156

NUMBER OF DATA PAIRS USED: 6

RESIDUAL VARIANCE: 0.00040

95% CONFIDENCE FACTOR: 1.16021 FOR EC50

CORRELATION COEFFICIENT [illegible]

COEFFICIENT OF DETERMINATION: R [illegible]

EFFECTIVE CONCENTRATIONS (95% CONFIDENCE RANGE):

EC50 =	1004.9601 mg/L	[illegible]	[illegible]	***
EC[illegible] =	35[illegible] mg/L	[illegible]	[illegible]	
EC[illegible] =	1[illegible] mg/L	[illegible]	[illegible]	[illegible] ***
EC01 =	11.[illegible] mg/L	[illegible]	[illegible]	***

*** EXTRAPOLATED RESULT

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INITIAL DATA

NUMBER	CONCENTRATION	GAMMA	% EFFECT	
1	[illegible]	[illegible]	[illegible]	
2	[illegible]	[illegible]	[illegible]	
3	250.0000	0.199	[illegible]	
4	[illegible]	0.183	[illegible]	[illegible]
5	500.0000	0.365	[illegible]	
6	[illegible]	0.343	[illegible]	[illegible]
7	[illegible]	0.740	[illegible]	
8	[illegible]	0.818	[illegible]	[illegible]

Touch SPACE BAR [illegible]

FINAL RESULTS

NUMBER	CONC.	GAMMA	GAMMA EST.	% EFFECT
3	[illegible]	0.1995	0.1856	[illegible]
4	250.0000	0.1829	0.1856	15.464
5	500.0000	0.3651	0.3746	26.744
6	500.0000	0.3430	0.3746	25.542
7	1000.0000	0.7400	0.7560	42.528
8	1000.0000	0.8176	0.7560	44.982

EC501304.9501 mg/L (95% CONFIDENCE RANGE:1116.0963 TO 1525.7596)

Touch SPACE BAR to continue....

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MICROTOX DATA REPORT

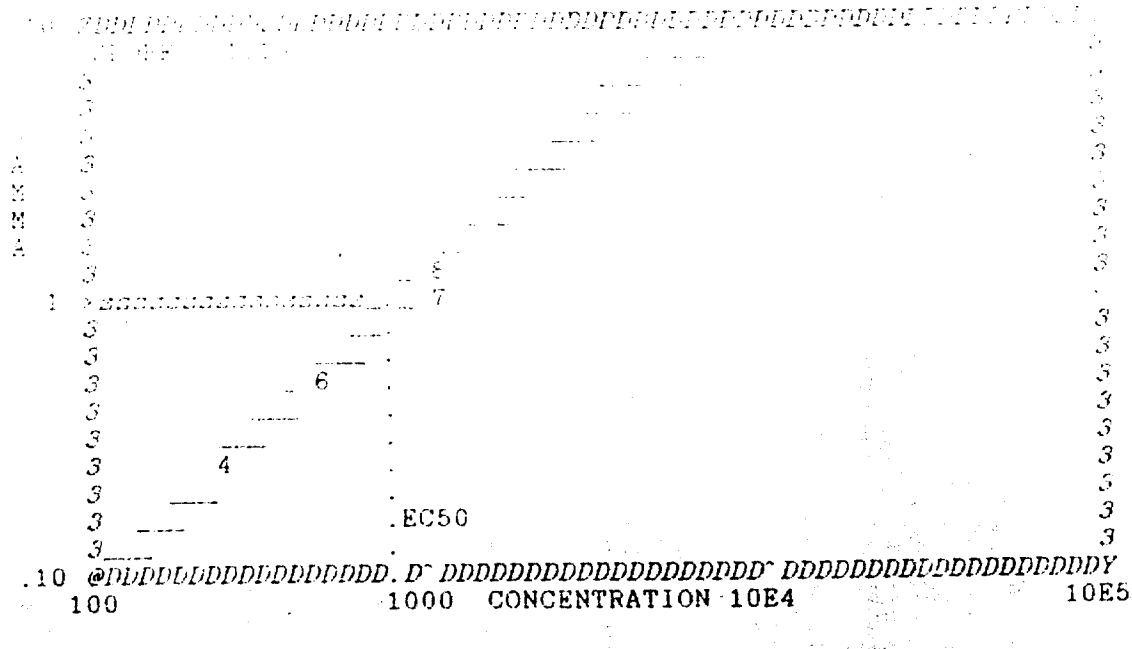
FILE NAME: N3188.K15

TEST DATE: [illegible]
TEST TIME: [illegible]
Approved by: [illegible]

Investigator: [illegible]
Sample Description: FC-3017
Procedure: BASIC
Initial Concentration : 1000 mg/L
Test Time: 15 minutes

Osmotic Adjustment: NaCl
Dilution Factor : 2
Concentration Units: mg/L

NUMBER	10/1T	CONC.	GAMMA
1	58.13/ 45.13	125.0000	0.11767
2	55.85/ 46.02	125.0000	0.[illegible]250
3	[illegible].73/ 38.[illegible]4	250.0000	[illegible]#
4	65.74/ 39.75	250.0000	[illegible]#
5	55.51/ 31.45	500.0000	[illegible]#
6	83.45/ 30.73	500.0000	[illegible]#
7	[illegible].15/ 21.[illegible]	1000.0000	[illegible]#
8	76.77/ 18.[illegible]	1000.0000	[illegible]#
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]		



EC50 784.8150 (95% CONFIDENCE RANGE: 728.4058 TO 845.5927)

Used for calculations

STATISTICAL REPORT FOR DATA FILE N3188.K15

ESTIMATING EQUATION: LOG C = 0.9025 x LOG *b* +2.8948

NUMBER OF DATA PAIRS USED: 6

RESIDUAL VARIANCE: 0.00050

95% CONFIDENCE FACTOR: 1.07744 FOR EC50

CORRELATION COEFFICIENT: R = 0.99724

COEFFICIENT OF DETERMINATION: R^2 = 0.99450

EFFECTIVE CONCENTRATIONS (95% CONFIDENCE RANGE):

EC50 =	784.8150 mg/L	(	728.4058	TO	845.5927)
EC20 =	224.6047 mg/L	(	203.0035	TO	248.5043)***
EC10 =	108.0389 mg/L	(	91.2765	TO	127.8797)***
EC01 =	12.4091 mg/L	(	8.4346	TO	18.2565)***

*** EXTRAPOLATED RESULTS

INITIAL DATA N3188.K15

NUMBER	CONCENTRATION	GAMMA	% EFFECT	
1	125.0000	0.118	10.53	
2	125.0000	0.092	8.47	9.50
3	250.0000	0.296	22.85	
4	250.0000	0.277	21.69	22.27
5	500.0000	0.592	37.20	
6	500.0000	0.590	37.12	37.16
7	1000.0000	1.235	55.26	
8	1000.0000	1.409	58.50	56.88

Touch SPACE BAR to continue....

FINAL RESULTS N3188.K15

NUMBER	CONC.	GAMMA	GAMMA EST.	% EFFECT
3	250.0000	0.2961	0.2827	22.846
4	250.0000	0.2770	0.2827	21.690
5	500.0000	0.5923	0.6068	37.197
6	500.0000	0.5903	0.6068	37.120
7	1000.0000	1.2352	1.3025	55.261
8	1000.0000	1.4094	1.3025	58.496

[illegible] 81.60 mg/L (95% CONFIDENCE RANGE [illegible] 056 TO 845.5927)

MICROTOX DATA REPORT

FILE NAME: N3188.K30

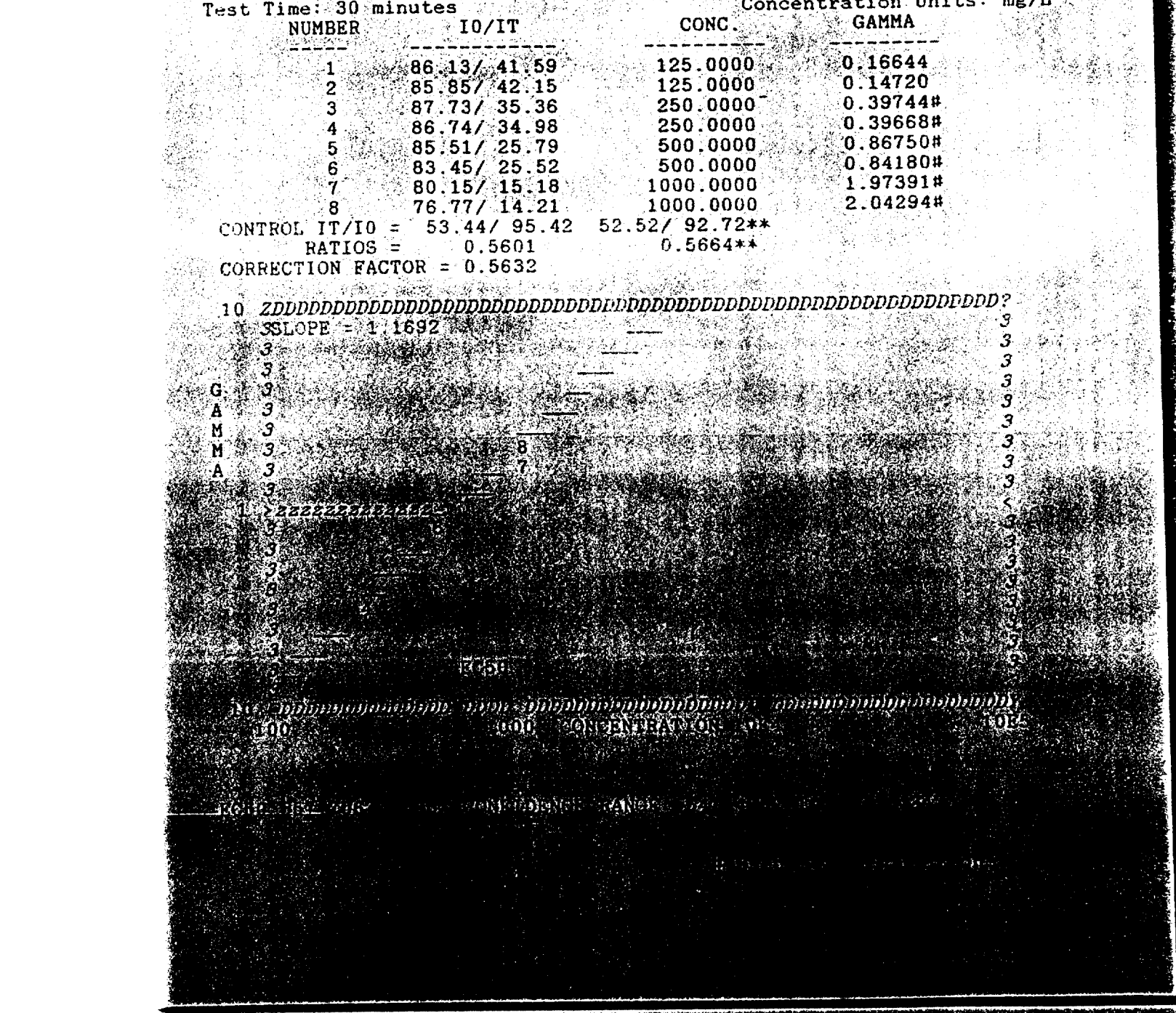
TEST DATE: 9/26/95
TEST TIME: 10:30AM
Approved by: _____

Investigator: GWJ
Sample Description: FC-3017
Procedure: BASIC
Initial Concentration : 1000 mg/L
Test Time: 30 minutes

Osmotic Adjustment: NaCl
Dilution Factor : 2
Concentration Units: mg/L

NUMBER	IO/IT	CONC.	GAMMA
1	86.13/ 41.59	125.0000	0.16644
2	85.85/ 42.15	125.0000	0.14720
3	87.73/ 35.36	250.0000	0.39744#
4	86.74/ 34.98	250.0000	0.39668#
5	85.51/ 25.79	500.0000	0.86750#
6	83.45/ 25.52	500.0000	0.84180#
7	80.15/ 15.18	1000.0000	1.97391#
8	76.77/ 14.21	1000.0000	2.04294#
CONTROL IT/IO =	53.44/ 95.42	52.52/ 92.72**	
RATIOS =	0.5601	0.5664**	

CORRECTION FACTOR = 0.5632



STATISTICAL REPORT FOR DATA FILE N3188.K30

ESTIMATING EQUATION: LOG C = 0.8541 x LOG *b* +2.7464

NUMBER OF DATA PAIRS USED: 6

RESIDUAL VARIANCE: 0.00012

95% CONFIDENCE FACTOR: 1.02998 FOR EC50

CORRELATION COEFFICIENT: R = 0.99932

COEFFICIENT OF DETERMINATION: R^2 = 0.99864

EFFECTIVE CONCENTRATIONS (95% CONFIDENCE RANGE):

EC50 =	557.7067 mg/L	(	541.4752 TO	574.4247)	
EC20 =	170.6819 mg/L	(	160.3766 TO	181.6493)	***
EC10 =	85.3864 mg/L	(	77.6362 TO	93.9104)	***
EC01 =	11.0138 mg/L	(	9.0374 TO	13.4225)	***

*** EXTRAPOLATED RESULTS

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INITIAL DATA N3188.K30

NUMBER	CONCENTRATION	GAMMA	% EFFECT	
1	125.0000	0.166	14.27	
2	125.0000	0.147	12.83	13.55
3	250.0000	0.397	28.44	
4	250.0000	0.397	28.40	28.42
5	500.0000	0.868	46.45	
6	500.0000	0.842	45.71	46.08
7	1000.0000	1.974	66.37	
8	1000.0000	2.043	67.14	66.76

Touch SPACE BAR to continue....

FINAL RESULTS N3188.K30

NUMBER	CONC	GAMMA	GAMMA EST	% EFFECT
3	250.0000	0.3974	0.3913	28.440
4	250.0000	0.3967	0.3913	28.401
5	500.0000	0.8675	0.8800	46.453
6	500.0000	0.8418	0.8800	45.705
7	1000.0000	1.9739	1.9789	66.374
8	1000.0000	2.0429	1.9789	67.137

EC50 = 557.2087 [illegible] 95% CONFIDENCE RANGE = (541.4752 TO 574.4247)

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