ACUTE TOXICITY TO FISH

TEST SUBSTANCE

Identity: Perfluorooctanesulfonylamido(ethyl)acetate; may also be referred to as PFOSAA, FC-128 or as the major component of FC-127, FC-129, FC-109, or FC-109-X. (Glycine, N-ethyl-N-[(heptadecafluorooctyl)sulfonyl]-, potassium salt, CAS # 2991-51-7)

Remarks: The test sample is FC-128. Current information indicates it is a mixture of 86% test substance and 14% C_4-C_7 fluoroalkyl carboxylate compounds. 3M production lot number 751.

METHOD:

Method: Not noted.
Type: Static acute
GLP: No
Year completed: 1977
Species: *Pimephales promelas*
Supplier: Not noted.
Analytical monitoring: Temperature, pH and DO
Exposure period: 96-hours
Statistical methods: Probit analysis.
Test fish age: Not noted.
Length and weight: Average length = Not noted
Average weight = 1.1 g
Pretreatment: Not noted.

Test conditions:
Dilution water: Aerated carbon-filtered well water
Dilution water chemistry:
Initial Dissolved Oxygen: >9.0 mg/L
hardness: Not noted
alkalinity: Not noted
pH: Not noted
Conductivity: Not noted

Stock and test solution preparation: Not noted
Concentrations dosing rate: Once
Stability of the test chemical solutions: Not noted
Exposure vessels: Not noted.
Number of replicates: one
Number of fish per replicate: 10
Number of concentrations: five plus a negative control

Water chemistry during the study:

Dissolved oxygen range (0 – 96 hours):

5.7 – >9.0 mg/L (control exposure)

5.1 - >9.0 mg/L (180 mg/L exposure)*

pH range (24 – 96 hours):

7.6 – 7.8 (control exposure)

7.5 – 7.9 (180 mg/L exposure)*

* 180 mg/L test group data given because total mortality occurred in the 320 mg/L test group by 72 hours and all data was not collected.

Test temperature (0 – 96 hours): 62 to 67°F

RESULTS

Nominal concentrations: Bk control, 32, 56, 100, 180, and 320 mg/L
Element value: 96-hour LC50 = 100 (70 - 142) mg/L

All element values based on nominal concentrations

Statistical Evaluation of Mortality:
Probit analysis was used to calculate LC50 value and the corresponding confidence limits.

CONCLUSIONS

The test sample 96-hour LC_{50} for fathead minnow was determined to be 100 mg/L with a 95% confidence interval of 70 - 142 mg/L.

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

DATA QUALITY

Reliability: Klimisch ranking 3. This study lacks documentation and information on the methodology. Sample purity was not properly characterized. Test concentrations were not characterized.

REFERENCES

This study was conducted by the 3M Company, Environmental Laboratory, St. Paul, MN, completed on August 26, 1977.

OTHER

Last changed: 5/18/00

740101

(3)

ENVIRONMENTAL ENGINEERING LABORATORY
AQUATIC TOXICITY WORK SHEET

Type Test 96 Hours - STATIC

Material Tested FC-12B LOT 751

Test Organism Fathead Minnow

Avg. Weight 1.1g Avg. Size

Date Started 8-22-77

Date Completed 8-26-77

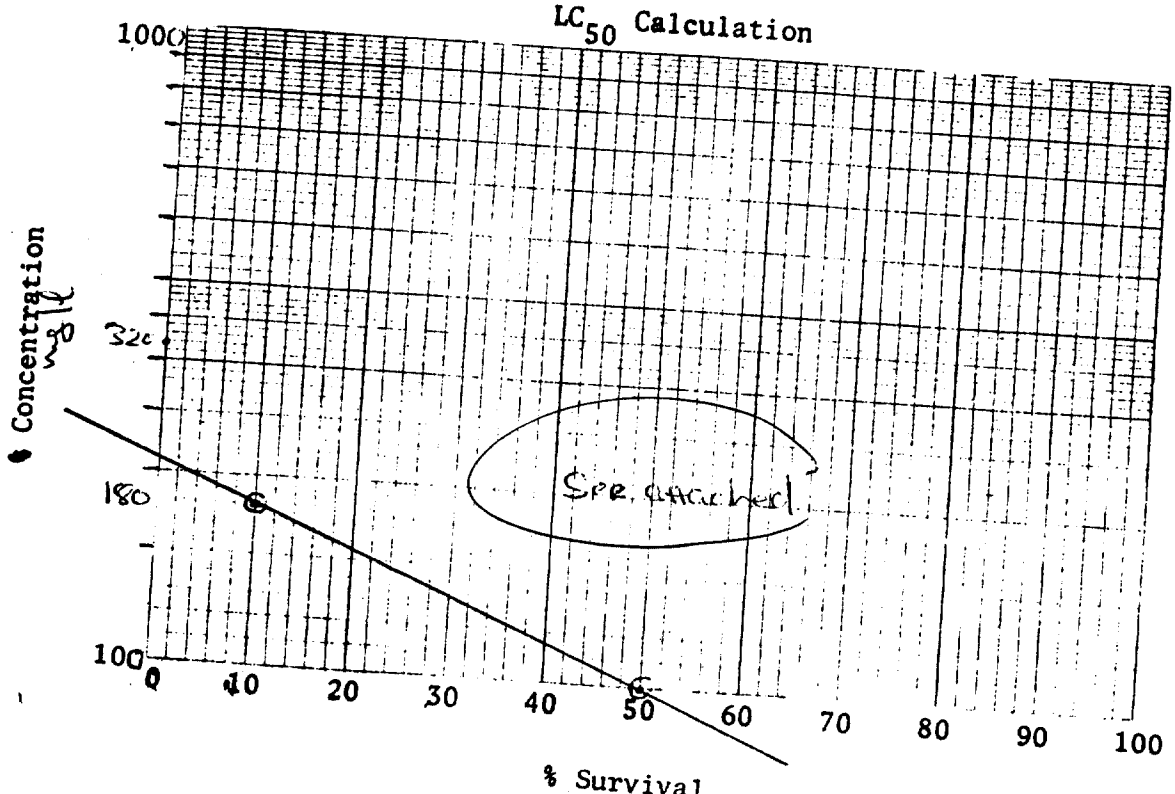
Time Started 2:00 PM

Plotted LC_{50} 100 mg/l

Dilution Water Carbon Filtered - Well Water (Aerated)

Conc.	24 hrs % Survival	pH	D.O ppm	48 hrs % Survival	pH	D.O ppm	72 hrs % Survival	pH	D.O ppm	96 hrs % Survival	pH	D.O ppm
Control	100	7.7	6.8	100	7.8	6.2	100		5.8	100	7.6	5.7
mg/l												
B 32	100	7.8	—	100	7.8	7.3	100		6.0	100	7.3	5.4
B 56	100	7.9	3.1	100	7.8	7.5	100		6.2	90	7.3	5.3
B 100	100	7.9	3.4	100	7.8	7.8	100		6.3	50	7.5	5.0
B 180	100	7.9	3.4	100	7.7	7.5	70		6.0	10	7.5	5.1
B 320	80	7.9	2.7	30	7.8	7.8	0		6.0	0	—	—
Average Temperature	62			65			65			67		

Comments: INITIAL D.O. >9.0 mg/l
" TEMP. 62°F



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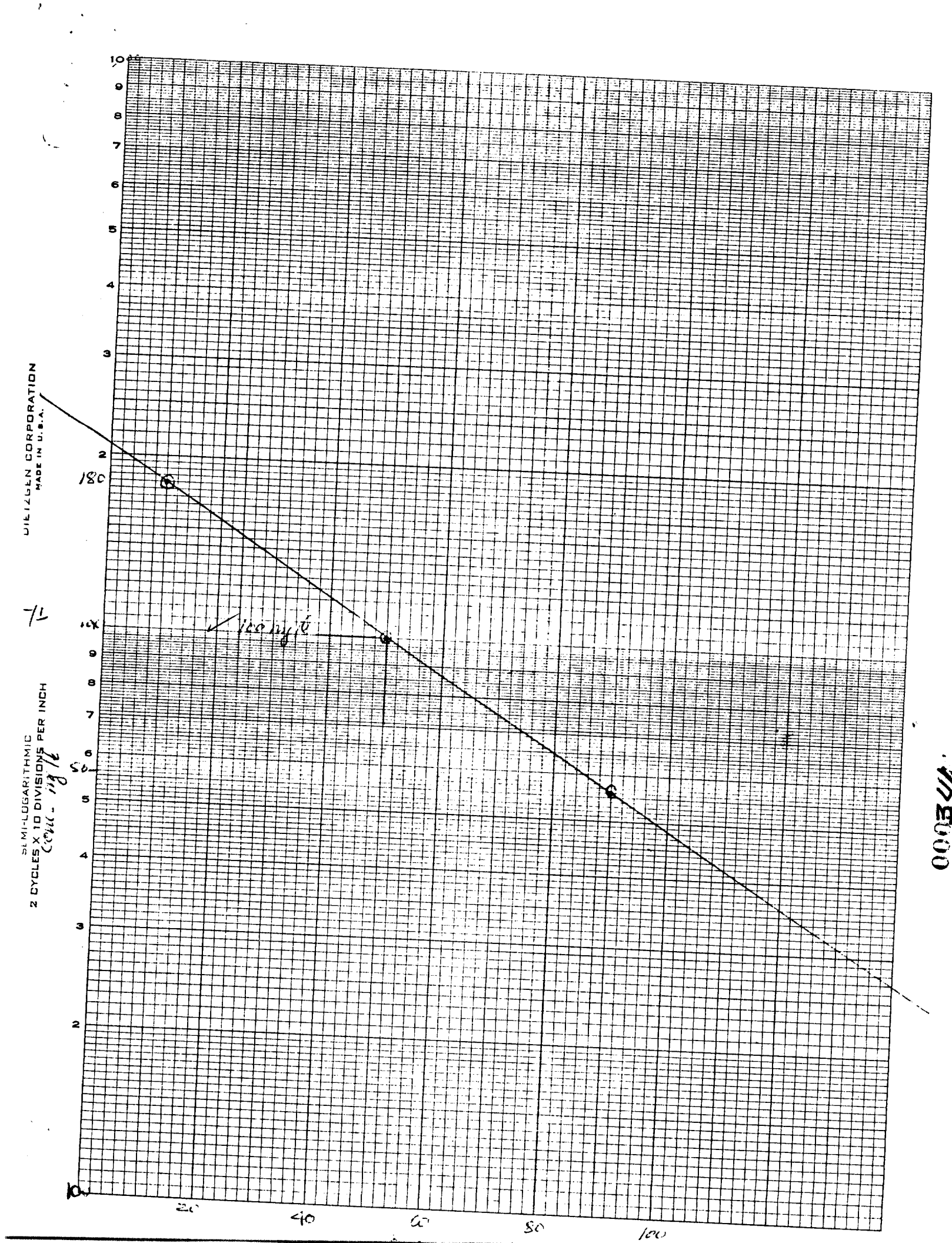

KEUFFEL & ESSER CO.
MADE IN U.S.A.
SEMI-LOGARITHMIC
2 CYCLES X 10 DIVISIONS PER INCH
180
140
50
10
20
40
60
80
100

AQUATIC TOXICITY - PROBIT ANALYSIS WORK SHEET

Date Started: _____ Material Tested: FC-128

Time Started: _____ (AM) (PM) Test Organism (Fathead minnow)

Type Test: (Continuous Flow) (Static) Avg. Wt. _____ (gram) Avg. Size _____ (inc

Exposure Period: _____ -Hour Date Completed: _____

Diluent: (carbon-filt.-St.P. City Wtr.) Analysis by: _____

(1) K No. of Doses Plotted	mg/l Conc.	Observed % Mortality	(2) Expected % Mortality	(3) Corrected Values	O - E Observed-Expected	Contributi to chi (fro Nomograph
1	32	0	.6	.3		
2	56	10				
3	100	50				
4	180	90				
5	320	100	99.4	99.7		
6						
7						

K = 10 Animals/Dose = _____ Total contribution to chi = _____

Total Animals = _____ (chi^2) = contrib. to chi x Tot. Animals / K = _____

chi^2 (P-.05) for (K-2) _____ degree of freedom (from Table 2) = _____

_____ is less than _____; therefore, the data are not significan

heterogenous.

95% Confidence Limits for LC_{50}*

LC_{84} = 150 mg/l LC_{50} = 100 mg/l LC_{16} = 68 mg/l

Slope function (S) = LC_{84}/LC_{50} + LC_{50}/LC_{16} = $\frac{1 + 1}{2}$ = $\frac{1.5 + 1.47}{2}$ = 1.49

Total number of animals used between 16% and 84% expected effects (N') = 10

$fLC_{50} = (S)^{2.77/\sqrt{N'}} = (1.49)^{.88}$ = (from Nomograph #2) 1.42

LC_{50}/fLC_{50} = lower limit = 100 / 1.42 = 70.4

LC_{50} X fLC_{50} = upper limit = 100 X 1.42 = 142

LC_{50} = 100 mg/l (95% confidence limits 70.4 to 142

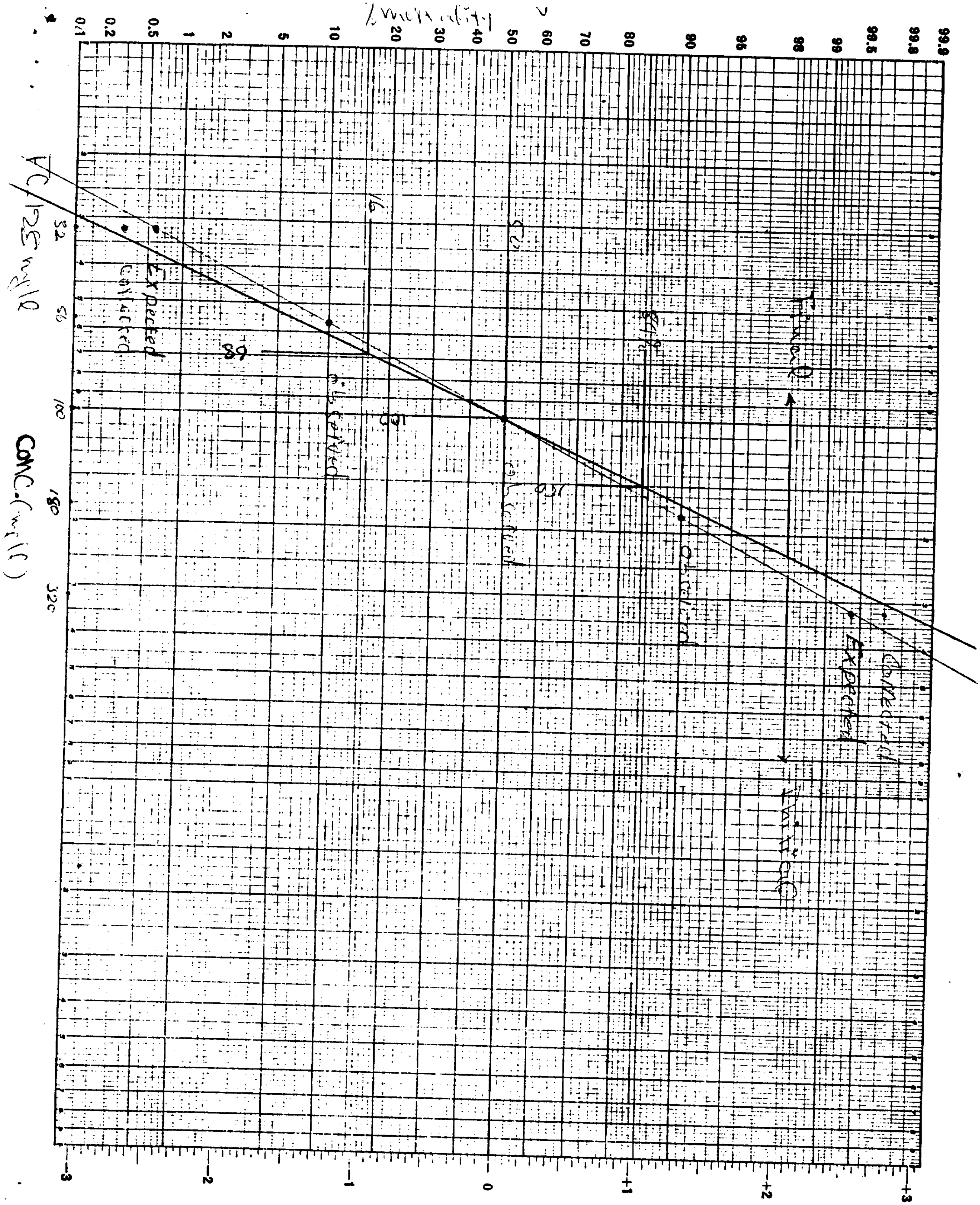
70 - 142

(1) Do not list more than two consecutive 0% effects or more than two consecutive 100% effects.

(2) Expected value for any dose should be greater than 0.01% or less than 99.99%.

(3) Corrected value for each 0% or 100% effect (from Table 1).

* There is a 95% chance that the true value of LC_{50} lies within these limits.


% Mortality
FC/125 mg/l
CONC. (mg/l)
Expected
Corrected
Final
Initial
0.1
0.2
0.5
1
2
5
10
20
30
40
50
60
70
80
90
95
98
99
99.5
99.8
99.9
-3
-2
-1
0
+1
+2
+3