FYI-0794-001226

Satish

Have someone contact American Cyanamid to see if they will provide a copy of this report to the ITC.

Joan L. Gallagher
Manager
Regulatory Activities
Toxicology & Product Safety Department
Chemicals Group
American Cyanamid Company
One Cyanamid Plaza
Wayne, NJ 07470
(201) 831-3416

# THE ACUTE TOXICITY OF TWENTY POLYELECTROLYTES TO THE BLUEGILL SUNFISH *Lepomis macrochirus* Rafinesque AND RAINBOW TROUT *Salmo gairdneri* Richardson

| | | |
|---|---|---|
| Magnifloc 834A | Magnifloc 567C | Magnifloc 1561C |
| Magnifloc 837A | Magnifloc 581C | Magnifloc 1563C |
| Magnifloc 900N | Magnifloc 585C | Superfloc 204 |
| Magnifloc 515C | Magnifloc 591C | Superfloc A130 |
| Magnifloc 507C | Magnifloc 1839A | Superfloc N100 |
| Magnifloc 521C | Magnifloc 1820A | Cyanatrol WF950S |
| Magnifloc 2535C | Magnifloc 1906N | |

Contains No CBI

FYI-94-001226
INIT 07/26/94

Prepared For

American Cyanamid Company
Wayne, New Jersey 07476

Prepared By

UNION CARBIDE ENVIRONMENTAL SERVICES
Union Carbide Corporation
Tarrytown, New York 10591

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RECEIVED

84940000289

April 28, 1978

Bob - Only the encircled polyelectrolyte. This report (ref = IR-453) contained data on

Could Dynamac obtain the complete report? I'd like to look at it before I complete my rec for IR-453, etc.

Larry - Should any of the 19 polyelectrolytes listed above be in the 8d cationic surfactants rule

J.D.W. 12-27-88

0 0 0 3

Report # 78-78

Final Copy

UCES Proj. No. 11506-47-1
to 11506-47-40

# THE ACUTE TOXICITY OF TWENTY POLYELECTROLYTES TO THE BLUEGILL SUNFISH *Lepomis macrochirus* Rafinesque AND RAINBOW TROUT *Salmo gairdneri* Richardson

| | | |
|---|---|---|
| Magnifloc 834A | Magnifloc 567C | Magnifloc 1561C |
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| Magnifloc 900N | Magnifloc 585C | Superfloc 204 |
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| Magnifloc 507C | Magnifloc 1839A | Superfloc N100 |
| Magnifloc 521C | Magnifloc 1820A | Cyanatrol WF950S |
| Magnifloc 2535C | Magnifloc 1906N | |

Prepared For

American Cyanamid Company
Wayne, New Jersey 07476

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UNION CARBIDE ENVIRONMENTAL SERVICES
Union Carbide Corporation
Tarrytown, New York 10591

April 28, 1978

0 0 0 4

Report Prepared By

Charles W. Calmbacher
Aquatic Toxicologist

Report Approved By

Algirdas G. Vilkas
Section Leader
Aquatic Toxicology

Report Approved By

Curt Hutchinson
Manager
UNION CARBIDE CORPORATION
ENVIRONMENTAL SERVICES

Notebook Reference: No. 4627 pages 5-84

Date of Report: April 28, 1978

Title of Report: The Acute Toxicity of Twenty Polyelectrolytes to the Bluegill Sunfish, *Lepomis macrochirus* Rafinesque, and Rainbow Trout, *Salmo gairdneri* Richardson

## INTRODUCTION

This study was conducted at the request of American Cyanamid Company to determine the static acute toxicity of the compounds listed in Table 1 to bluegill sunfish and rainbow trout. The test was performed at Union Carbide Environmental Services' (UCES) toxicity laboratory in Tarrytown, New York. The test materials as supplied to UCES for testing were slightly water soluble.

The bluegill sunfish, Lepomis macrochirus Rafinesque, is a warm-water fish usually found in ponds, lakes and sluggish streams with bottoms of sand, gravel or mud. They feed on a variety of aquatic organisms including fish eggs, small fish, snails, insects and amphipods. Bluegills prefer temperatures above 20°C and can tolerate a wide pH range. Rainbow trout, Salmo gairdneri Richardson, are found in streams, lakes and reservoirs throughout the United States. They are tolerant of a wide pH range and prefer water temperatures below 20°C. Trout are an extremely valuable aquatic resource both from an ecological and sport fishing standpoint. Because of their wide geographic distribution, temperature requirements, and importance as food web organisms, these organisms have have been recommended by the Committee on Methods for Acute Toxicity Tests with Aquatic Organisms (1975) as bioassay organisms.

## METHODS

Dilution water used in the basic toxicity tests at the UCES laboratory is obtained from a well on the Tarrytown site, treated

Table 1

**Test Materials**

| | |
|---|---|
| Magnifloc 834A | Magnifloc 591C |
| Magnifloc 837A | Magnifloc 1839A |
| Magnifloc 900N | Magnifloc 1820A |
| Magnifloc 515C | Magnifloc 1906N |
| Magnifloc 507C | Magnifloc 1561C |
| Magnifloc 521C | Magnifloc 1563C |
| Magnifloc 2535C | Superfloc 204 |
| Magnifloc 567C | Superfloc A130 |
| Magnifloc 581C | Superfloc N100 |
| Magnifloc 585C | Cyanatrol WF950S |

with a Continental Reverse Osmosis Water System (Model 3020) and deionized. After treatment, the water is reconstituted to the desired pH and hardness according to the procedures of Marking and Dawson (1973). Dilution water quality parameters for each of the tests are presented in tables pertinent to each of the compounds tested. Hardness and alkalinity were determined according to standard analytical procedures (American Public Health Association, 1976), pH with an ORION pH Meter, conductivity with a YSI conductivity bridge and dissolved oxygen with a YSI Oxygen Meter.

For each of the tests, five concentrations and a control were used in determining the toxicity of the test material to bluegill sunfish and rainbow trout. Test methodology followed recommended bioassay practices (U. S. Environmental Protection Agency, 1975) with the exception that replicate concentrations were not used. Fresh stock solutions for the tests were prepared by weight and diluted to volume in volumetric glassware with deionized water. The tests were conducted in 19.6 liter, chemically clean glass jars containing 15 liters of water. The tests were started by introducing the toxicant into test vessels containing dilution water, thoroughly mixing, and then introducing the fish.

Bluegill sunfish were obtained from a commercial fish hatchery in Nebraska, while the rainbow trout used in this study were cultured in the UCES laboratory from eggs obtained from a

4

commercial trout hatchery in Washington. The bluegills and rainbow trout were maintained in the laboratory at 22°C and 13°C, respectively, according to the procedures of Brauhn, Schoettger and Mueller (1975). Mortalities in the stock cultures over a one month period were less than two percent. Fish used in these tests were randomly selected from the stock cultures and acclimated to the test water (at the respective temperature for each species) for 24 hours prior to testing. Forty-eight hours before initiating the tests the fish were taken off feed. Ten individuals were placed in each of the 19.6 liter test vessels.

Dissolved oxygen and temperature were determined initially and every 48 hours thereafter for the control, high, medium and low toxicant concentrations, while pH was determined initially and at the termination of the test for the above. In addition to obtaining the above chemical and physical parameters, abnormal behavioral responses of the test fish were noted and recorded at 24 hour intervals.

The concentration of toxicant lethal to 50% of the population ($LC_{50}$'s) and 95% confidence intervals were determined at 24, 48 and 96 hour exposure periods (where possible) by the Spearman-Kärber Estimator (Finney, 1971). The $LC_{50}$ determinations were based upon nominal concentrations of the test materials in soft reconstituted well water. The no effect level was determined

at the 96 hour exposure period. This value is based upon observed abnormal behavior and may not necessarily be related to death.

**RESULTS**

Percent mortalities and the $LC_{50}$ values with their respective confidence intervals, and chemical and physical parameters monitored during the test, are presented in Tables 2-109. Each table is titled with respect to its pertinent compound. It should be noted that $LC_{50}$ values may vary with different species, temperatures and water qualities.

Table 2
96 Hour $LC_{50}$ Values (mg/l)
And 95% Confidence Intervals Where Available

| Test Material | Rainbow Trout | Bluegill Sunfish |
|---|---|---|
| Magnifloc 834A | >100.0 | >100.0 |
| Magnifloc 837A | >100.0 | >100.0 |
| Magnifloc 900N | >100.0 | >100.0 |
| Magnifloc 515C | >180.0 | 118.5 (88.4 - 158.8) |
| Magnifloc 507C | See text | 36.0 (30.2 - 42.9) |
| Magnifloc 521C | 0.57 (0.46 - 0.71) | 1.2 (1.0 - 1.4) |
| Magnifloc 2535C | 3.35 (2.77 - 4.04 | 17.7 (14.6 - 21.5) |
| Magnifloc 567C | See text | 1.3 (1.1 - 1.4) |
| Magnifloc 581C | 0.42 | 0.53 (0.44 - 0.64) |
| Magnifloc 585C | See text | 1.28 (1.14 - 1.43) |
| Magnifloc 591C | 0.60 (0.49 - 0.72) | 0.90 (0.70 - 1.10) |
| Magnifloc 1839A | 75.2 | 89.5 (75.0 - 106.7) |
| Magnifloc 1820A | 53.2 (44.1 - 64.3) | 84.4 (68.4 - 104.2) |
| Magnifloc 1906N | >100.0 | >100.0 |
| Magnifloc 1561C | 2.7 (2.2 - 3.3) | 17.0 (13.1 - 22.1) |
| Magnifloc 1563C | 1.14 (0.95 - 1.36) | 4.5 (4.0 - 5.0) |
| Superfloc 204 | >100.0 | >100.0 |
| Superfloc A130 | >100.0 | >100.0 |
| Superfloc N100 | >100.0 | >100.0 |
| Cyanatrol WF950S | >100.0 | >100.0 |

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| | |
|---|---|
| Client: | American Cyanamid Company |
| Date: | The test was conducted from 30 January through 3 February 1978. |
| Material: | Magnifloc 834A |
| UCES Proj. No. | 11506-47-27 |
| Summary: | The 96 hour $LC_{50}$ of Magnifloc 834A to bluegill sunfish is >100.0 mg/l. The observed no effect level is 56.0 mg/l. |
| Species: | Bluegill sunfish, Lepomis macrochirus |
| Length: | 36 mm |
| Weight: | 0.56 grams |
| Biological Loading: | 0.37 g/l |
| Source: | Nebraska |
| 96 Hour $LC_{50}$: | >100.0 mg/l |
| 95% Conf. Limits: | Not available |
| No Effect Level: | 56.0 mg/l |
| Water Quality: | Soft |
| Temperature: | 22.0°C |
| pH: | 7.57 |
| Hardness (as $CaCO_3$): | 44 mg/l |
| 96 Hr. $LC_{50}$ Ref. Toxicant p,p'-DDT: | 4.03 (3.59-4.52) µg/l |
| Notebook Reference: | No. 4627, pages 63, 64 |

**Table 3**
**Percent Mortalities and $LC_{50}$ Values - American Cyanamid Company**
**Magnifloc 834A - Bluegill Sunfish**

**Percent Mortality**

| | Control | Test Material, Nominal Conc. mg/l | | | | |
|---|---|---|---|---|---|---|
| | | 10.0 | 18.0 | 32.0 | 56.0 | 100.0 |
| 24 hour | 0% | 0% | 0% | 0% | 0% | 0% |
| 48 hour | 0% | 0% | 0% | 0% | 0% | 0% |
| 96 hour | 0% | 0% | 0% | 0% | 0% | 0% |

$LC_{50}$ Values

| | | 24 Hour | 48 Hour | 96 Hour |
|---|---|---|---|---|
| $LC_{50}$, mg/l | | >100.0 | >100.0 | >100.0 |
| 95% Confidence Limits | Low | N.A. | N.A. | N.A. |
| | High | N.A. | N.A. | N.A. |

Observed 96 hour no effect level: 56.0 mg/l.
N.A. = Not available due to lack of mortalities.

**Table 4**
**Physical and Chemical Parameters - American Cyanamid Company**
**Magnifloc 834A - Bluegill Sunfish**

Dilution Water

pH: 7.57
Average Temperature: 22.0°C
Range: ±0.5°C

Total Hardness: 44 mg/l as $CaCO_3$
Total Alkalinity: 31 mg/l as $CaCO_3$
Conductivity: 147 µmhos/cm

Dissolved Oxygen, mg/l

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 10.0 | 32.0 | 100.0 |
| Initial | 9.3 | 9.1 | 9.0 | 9.4 |
| 48 hour | 6.5 | 5.8 | 6.0 | 5.7 |
| 96 hour | 5.9 | 5.5 | 5.6 | 5.0 |

pH

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 10.0 | 32.0 | 100.0 |
| Initial | 7.57 | 7.83 | 7.96 | 7.95 |
| 96 hour | 7.12 | 7.07 | 7.10 | 7.07 |

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| | |
|---|---|
| Client: | American Cyanamid Company |
| Date: | The test was conducted from 10 February through 14 February 1978. |
| Material: | Magnifloc 834A |
| UCES Proj. No.: | 11506-47-28 |
| Summary: | The 96 hour $LC_{50}$ of Magnifloc 834A to rainbow trout is >100.0 mg/l. The 96 hour no effect level was observed to be 10.0 mg/l. |
| Species: | Rainbow trout, Salmo gairdneri |
| Length: | 47 mm |
| Weight: | 0.79 grams |
| Biological Loading: | 0.53 g/l |
| Source: | Washington |
| 96 Hour $LC_{50}$: | >100.0 mg/l |
| 95% Conf. Limits: | Not available |
| No Effect Level: | 10.0 mg/l |
| Water Quality: | Soft |
| Temperature: | 12.0 ± 0.5°C |
| pH: | 7.47 |
| Hardness (as $CaCO_3$): | 42 mg/l |
| 96 Hr. $LC_{50}$ Ref. Toxicant p,p'-DDT: | 10.59 (8.31-13.50) µg/l |
| Notebook Reference: | No. 4627, pages 65, 66 |

Table 5
Percent Mortalities and $LC_{50}$ Values - American Cyanamid Company
Magnifloc 834A - Rainbow Trout

Percent Mortality

| | Control | Test Material, Nominal Conc mg/l | | | | |
|---|---|---|---|---|---|---|
| 24 hour | 0% | 0% | 0% | 0% | 0% | 0% |
| 48 hour | 0% | 0% | 0% | 0% | 0% | 0% |
| 96 hour | 0% | 0% | 0% | 0% | 0% | 0% |

$LC_{50}$ Values

| | | 24 Hour | 48 Hour | 96 Hour |
|---|---|---|---|---|
| $LC_{50}$, mg/l | | >100.0 | >100.0 | >100.0 |
| 95% Confidence Limits | Low | N.A. | N.A. | N.A. |
| | High | N.A. | N.A. | N.A. |

Observed 96 hour no effect level: 100.0 mg/l.
N.A. = Not available due to lack of mortalities.

Table 6
Physical and Chemical Parameters - American Cyanamid Company
Magnifloc 834A - Rainbow Trout

Dilution Water

| | | | |
|---|---|---|---|
| pH: | 7.47 | Total Hardness: | 42 mg/l as $CaCO_3$ |
| Average Temperature: | 12.0°C | Total Alkalinity: | 35 mg/l as $CaCO_3$ |
| Range: | 0.5°C | Conductivity | 145 µmhos/cm |

Dissolved Oxygen, mg/l

| | Control | Test Material, Nom. Conc. mg/l 10.0 | 32.0 | 100.0 |
|---|---|---|---|---|
| Initial | 9.7 | 9.2 | 8.8 | 9.0 |
| 48 hour | 8.1 | 7.7 | 7.4 | 7.1 |
| 96 hour | 8.7 | 8.1 | 7.3 | 6.7 |

pH

| | Control | Test Material, Nom. Conc. mg/l 10.0 | 32.0 | 100.0 |
|---|---|---|---|---|
| Initial | 7.47 | 7.48 | 7.50 | 7.52 |
| 96 hour | 7.19 | 7.13 | 7.11 | 7.05 |

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| | |
|---|---|
| Client: | American Cyanamid Company |
| Date: | The test was conducted from 17 January through 21 January 1978. |
| Material: | Magnifloc 837A |
| UCES Proj. No. | 11506-47-29 |
| Summary: | The 96 hour $LC_{50}$ is greater than 100.0 mg/l and the observed no effect level is also greater than 100.0 mg/l. |
| Species: | Bluegill sunfish, Lepomis macrochirus |
| Length: | 35 mm |
| Weight: | 0.57 grams |
| Biological Loading: | 0.38 g/l |
| Source: | Nebraska |
| 96 Hour $LC_{50}$: | >100.0 mg/l |
| 95% Conf. Limits: | Not available |
| No Effect Level: | >100.0 mg/l |
| Water Quality: | Soft |
| Temperature: | 22.0 ± 1°C |
| pH: | 7.72 |
| Hardness (as $CaCO_3$): | 46 mg/l |
| 96 Hr. $LC_{50}$ Ref. Toxicant p,p'-DDT: | 4.03 (3.59 - 4.52) µg/l |
| Notebook Reference: | No. 4627, pages 55, 56 |

Table 7
Percent Mortalities and $LC_{50}$ Values - American Cyanamid Company
Magnifloc 837A - Bluegill Sunfish

Percent Mortality

| | Control | Test Material, Nominal Conc. mg/l | | | | |
|---|---|---|---|---|---|---|
| | | 10.0 | 18.0 | 32.0 | 56.0 | 100.0 |
| 24 hour | 0% | 0% | 0% | 0% | 0% | 0% |
| 48 hour | 0% | 0% | 0% | 0% | 0% | 0% |
| 96 hour | 0% | 0% | 0% | 0% | 0% | 0% |

$LC_{50}$ Values

| | | 24 Hour | 48 Hour | 96 Hour |
|---|---|---|---|---|
| $LC_{50}$, mg/l | | >100.0 | >100.0 | >100.0 |
| 95% Confidence Limits | Low | N.A. | N.A. | N.A. |
| | High | N.A. | N.A. | N.A. |

Fish behavior appeared normal at all concentrations tested. Therefore the 96 hour no effect level is greater than 100.0 mg/l.
N.A. = Not available.

Table 8
Physical and Chemical Parameters - American Cyanamid Company
Magnifloc 837A - Bluegill Sunfish

Dilution Water

pH: 7.72
Average Temperature: 22.0°C
Range: ±1.0°C

Total Hardness: 46 mg/l as $CaCO_3$
Total Alkalinity: 30 mg/l as $CaCO_3$
Conductivity: 158 µmhos/cm

Dissolved Oxygen, mg/l

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 10.0 | 32.0 | 100.0 |
| Initial | 9.0 | 8.6 | 8.6 | 8.4 |
| 48 hour | 6.0 | 5.6 | 6.3 | 6.0 |
| 96 hour | 5.2 | 5.6 | 5.5 | 5.5 |

pH

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 10.0 | 32.0 | 100.0 |
| Initial | 7.72 | 7.73 | 7.72 | 7.73 |
| 96 hour | 7.09 | 7.08 | 7.13 | 7.13 |

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| | |
|---|---|
| Client: | American Cyanamid Company |
| Date: | The test was conducted from 17 January through 21 January, 1978. |
| Material: | Magnifloc 837A |
| UCES Proj. No.: | 11506-47-30 |
| Summary: | The 96 hour $LC_{50}$ is greater than 100.0 mg/l and the observed no effect level is 18.0 mg/l. |

| | |
|---|---|
| Species: | Rainbow trout, Salmo gairdneri |
| Length: | 36 mm |
| Weight: | 0.27 grams |
| Biological Loading: | 0.18 g/l |
| Source: | Washington |
| 96 Hour $LC_{50}$: | >100.0 mg/l |
| 95% Conf. Limits: | Not available |
| No Effect Level: | 18.0 mg/l |
| Water Quality: | Soft |
| Temperature: | 12.0 ± 1°C |
| pH: | 7.48 |
| Hardness (as $CaCO_3$): | 46 mg/l |
| 96 Hr. $LC_{50}$ Ref. Toxicant p,p'-DDT: | 10.59 (8.31 - 13.50) µg/l |
| Notebook Reference: | No. 4627, pages 43, 44 |

Table 9
Percent Mortalities and $LC_{50}$ Values - American Cyanamid Company
Magnifloc 837A - Rainbow Trout

Percent Mortality

| | Control | Test Material, Nominal Conc. mg/l | | | | |
|---|---|---|---|---|---|---|
| | | 10.0 | 18.0 | 32.0 | 56.0 | 100.0 |
| 24 hour | 0% | 0% | 0% | 0% | 0% | 0% |
| 48 hour | 0% | 0% | 0% | 0% | 0% | 0% |
| 96 hour | 0% | 0% | 0% | 0% | 0% | 0% |

$LC_{50}$ Values

| | | 24 Hour | 48 Hour | 96 Hour |
|---|---|---|---|---|
| $LC_{50}$, mg/l | | >100.0 | >100.0 | >100.0 |
| 95% Confidence Limits | Low | N.A. | N.A. | N.A. |
| | High | N.A. | N.A. | N.A. |

Observed 96 hour no effect level: 18.0 mg/l.
N.A. = Not available.

Table 10
Physical and Chemical Parameters - American Cyanamid Company
Magnifloc 837A - Rainbow Trout

Dilution Water

pH: 7.48 Total Hardness: 46 mg/l as $CaCO_3$
Average Temperature: 12.7°C Total Alkalinity: 30 mg/l as $CaCO_3$
Range: 12.0-12.5°C Conductivity: 158 µmhos/cm

Dissolved Oxygen, mg/l

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 10.0 | 32.0 | 100.0 |
| Initial | 9.1 | 9.0 | 9.0 | 9.3 |
| 48 hour | 9.0 | 8.9 | 8.8 | 8.5 |
| 96 hour | 9.1 | 8.5 | 8.3 | 6.7 |

pH

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 10.0 | 32.0 | 100.0 |
| Initial | 7.48 | 7.45 | 7.44 | 7.43 |
| 96 hour | 7.26 | 7.23 | 7.27 | 7.08 |

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| | |
|---|---|
| Client: | American Cyanamid Company |
| Date: | The test was conducted from 17 January through 21 January 1978. |
| Material: | Magnifloc 900N |
| UCES Proj. No. | 11506-47-31 |
| Summary: | The 96 hour $LC_{50}$ is greater than 100.0 mg/l and fish behavior appeared normal at all concentrations tested. |

| | |
|---|---|
| Species: | Bluegill sunfish, Lepomis macrochirus |
| Length: | 32 mm |
| Weight: | 0.5 grams |
| Biological Loading: | 0.33 g/l |
| Source: | Nebraska |
| 96 Hour $LC_{50}$: | >100.0 mg/l |
| 95% Conf. Limits: | Not available |
| No Effect Level: | Test fish behavior was normal at all concentrations tested. |
| Water Quality: | Soft |
| Temperature: | 22.0 ± 1°C |
| pH: | 7.58 |
| Hardness (as $CaCO_3$): | 46 mg/l |
| 96 Hr. $LC_{50}$ Ref. Toxicant p,p'-DDT: | 4.03 (3.59 - 4.52) µg/l |
| Notebook Reference: | No. 4627, pages 53, 54 |

Table 11
Percent Mortalities and $LC_{50}$ Values - American Cyanamid Company
Magnifloc 900N - Bluegill Sunfish

Percent Mortality

| | Control | Test Material, Nominal Conc. mg/l | | | | |
|---|---|---|---|---|---|---|
| | | 10.0 | 18.0 | 32.0 | 56.0 | 100.0 |
| 24 hour | 0% | 0% | 0% | 0% | 0% | 0% |
| 48 hour | 0% | 0% | 0% | 0% | 0% | 0% |
| 96 hour | 0% | 0% | 0% | 0% | 0% | 0% |

$LC_{50}$ Values

| | | 24 Hour | 48 Hour | 96 Hour |
|---|---|---|---|---|
| $LC_{50}$, mg/l | | >100.0 | >100.0 | >100.0 |
| 95% Confidence Limits | Low | N.A. | N.A. | N.A. |
| | High | N.A. | N.A. | N.A. |

Fish behavior appeared normal at all concentrations tested. Therefore the no effect level is greater than 100.0 mg/l.
N.A. = Not available.

Table 12
Physical and Chemical Parameters - American Cyanamid Company
Magnifloc 900N - Bluegill Sunfish

Dilution Water

pH: 7.58
Average Temperature: 22.0°C
Range: ±1°C

Total Hardness: 46 mg/l as $CaCO_3$
Total Alkalinity: 30 mg/l as $CaCO_3$
Conductivity: 158 µmhos/cm

Dissolved Oxygen, mg/l

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 10.0 | 32.0 | 100.0 |
| Initial | 9.2 | 8.9 | 9.1 | 9.3 |
| 48 hour | 6.2 | 6.6 | 6.3 | 6.3 |
| 96 hour | 5.5 | 6.0 | 6.1 | 5.8 |

pH

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 10.0 | 32.0 | 100.0 |
| Initial | 7.58 | 7.59 | 7.72 | 7.69 |
| 96 hour | 7.13 | 7.15 | 7.14 | 7.09 |

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| | |
|---|---|
| Client: | American Cyanamid Company |
| Date: | The test was conducted from 17 January through 21 January 1978. |
| Material: | Magnifloc 900N |
| UCES Proj. No.: | 11506-47-32 |
| Summary: | The 96 hour $LC_{50}$ is greater than 100.0 mg/l and the observed no effect level is 56.0 mg/l. |
| Species: | Rainbow trout, Salmo gairdneri |
| Length: | 37 mm |
| Weight: | 0.32 grams |
| Biological Loading: | 0.21 g/l |
| Source: | Washington |
| 96 Hour $LC_{50}$: | >100.0 mg/l |
| 95% Conf. Limits: | Not available |
| No Effect Level: | 56.0 mg/l |
| Water Quality: | Soft |
| Temperature: | 12 ± 1°C |
| pH: | 7.46 |
| Hardness (as $CaCO_3$): | 46 mg/l |
| 96 Hr. $LC_{50}$ Ref. Toxicant p,p'-DDT: | 10.59 (8.31 - 13.50) µg/l |
| Notebook Reference: | No. 4627, pages 51, 52 |

Table 13
Percent Mortalities and $LC_{50}$ Values - American Cyanamid Company
Magnifloc 900N - Rainbow Trout

Percent Mortality

| | Control | Test Material, Nominal Conc. mg/l | | | | |
|---|---|---|---|---|---|---|
| | | 10.0 | 18.0 | 32.0 | 56.0 | 100.0 |
| 24 hour | 0% | 0% | 0% | 0% | 0% | 0% |
| 48 hour | 0% | 0% | 0% | 0% | 0% | 0% |
| 96 hour | 0% | 0% | 0% | 0% | 0% | 0% |

$LC_{50}$ Values

| | | 24 Hour | 48 Hour | 96 Hour |
|---|---|---|---|---|
| $LC_{50}$, mg/l | | >100.0 | >100.0 | >100.0 |
| 95% Confidence Limits | Low | N.A. | N.A. | N.A. |
| | High | N.A. | N.A. | N.A. |

Observed 96 hour no effect level: 56.0 mg/l.
N.A. = Not available.

Table 14
Physical and Chemical Parameters - American Cyanamid Company
Magnifloc 900N - Rainbow Trout

Dilution Water

pH: 7.46 Total Hardness: 46 mg/l as $CaCO_3$
Average Temperature: 12.2°C Total Alkalinity: 30 mg/l as $CaCO_3$
Range: 12.0-12.5°C Conductivity: 158 µmhos/cm

Dissolved Oxygen, mg/l

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 10.0 | 32.0 | 100.0 |
| Initial | 9.1 | 9.1 | 9.2 | 9.2 |
| 48 hour | 9.6 | 9.4 | 9.3 | 9.1 |
| 96 hour | 9.0 | 9.1 | 8.9 | 8.9 |

pH

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 10.0 | 32.0 | 100.0 |
| Initial | 7.46 | 7.45 | 7.42 | 7.39 |
| 96 hour | 7.31 | 7.33 | 7.26 | 7.24 |

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| | |
|---|---|
| Client: | American Cyanamid Company |
| Date: | The test was conducted from 9 January through 13 January 1978. |
| Material: | Magnifloc 515C |
| UCES Proj. No. | 11506-47-11 |
| Summary: | The 96 hour $LC_{50}$ is 118.5 mg/l and the observed no effect level is less than 56.0 mg/l. |

| | |
|---|---|
| Species: | Bluegill sunfish, Lepomis macrochirus |
| Length: | 38 mm |
| Weight: | 0.66 grams |
| Biological Loading: | 0.44 g/l |
| Source: | Nebraska |
| 96 Hour $LC_{50}$: | 118.5 mg/l |
| 95% Conf. Limits: | 88.4 - 158.8 mg/l |
| No Effect Level: | <56.0 mg/l |
| Water Quality: | Soft |
| Temperature: | 22 ± 2°C |
| pH: | 7.34 |
| Hardness (as $CaCO_3$): | 44 mg/l |
| 96 Hr. $LC_{50}$ Ref. Toxicant p,p'-DDT: | 4.03 (3.59 - 4.52) µg/l |
| Notebook Reference: | No. 4627, pages 37, 38 |

Table 15
Percent Mortalities and $LC_{50}$ Values - American Cyanamid Company
Magnifloc 515C - Bluegill Sunfish

Percent Mortality

| | Control | Test Material, Nominal Conc. mg/l | | | | |
|---|---|---|---|---|---|---|
| | | 56.0 | 100.0 | 180.0 | 320.0 | 560.0 |
| 24 hour | 0% | 10% | 50% | 60% | 100% | 100% |
| 48 hour | 0% | 10% | 50% | 60% | 100% | 100% |
| 96 hour | 0% | 10% | 50% | 60% | 100% | 100% |

$LC_{50}$ Values

| | | 24 Hour | 48 Hour | 96 Hour |
|---|---|---|---|---|
| $LC_{50}$, mg/l | | 118.5 | 118.5 | 118.5 |
| 95% Confidence Limits | Low | 88.4 | 88.4 | 88.4 |
| | High | 158.8 | 158.8 | 158.8 |

Observed 96 hour no effect level: <56.0 mg/l.

Table 16
Physical and Chemical Parameters - American Cyanamid Company
Magnifloc 515C - Bluegill Sunfish

Dilution Water

pH: 7.34
Average Temperature: 21°C
Range: ±2°C

Total Hardness: 44 mg/l as $CaCO_3$
Total Alkalinity: 35 mg/l as $CaCO_3$
Conductivity: 175 µmhos/cm

Dissolved Oxygen, mg/l

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 56.0 | 180.0 | 560.0 |
| Initial | 8.9 | 8.8 | 8.9 | 8.8 |
| 48 hour | 7.7 | 7.0 | 8.1 | * |
| 96 hour | 5.8 | 6.4 | 7.9 | * |

pH

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 56.0 | 180.0 | 560.0 |
| Initial | 7.34 | 7.26 | 7.07 | 6.68 |
| 96 hour | 7.09 | 7.12 | 7.25 | * |

*Data not collected after 100% mortality.

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| | |
|---|---|
| Client: | American Cyanamid Company |
| Date: | The test was conducted from 17 January through 21 January 1978. |
| Material: | Magnifloc 515C |
| UCES Proj. No.: | 11506-47-16 |
| Summary: | The 96 hour $LC_{50}$ is greater than 180.0 mg/l and the no effect level is 56.0 mg/l. Most likely the mortality at 56.0 mg/l is not toxicant related since there were no mortalities at higher concentrations. |
| Species: | Rainbow trout, *Salmo gairdneri* |
| Length: | 36 mm |
| Weight: | 0.3 grams |
| Biological Loading: | 0.20 g/l |
| Source: | Washington |
| 96 Hour $LC_{50}$: | >180.0 mg/l |
| 95% Conf. Limits: | Not available |
| No Effect Level: | 56.0 mg/l |
| Water Quality: | Soft |
| Temperature: | 12.0 ± 1°C |
| pH: | 7.44 |
| Hardness (as $CaCO_3$): | 46 mg/l |
| 96 Hr. $LC_{50}$ Ref. Toxicant p,p'-DDT: | 10.59 (8.31 - 13.50) µg/l |
| Notebook Reference: | No. 4627, pages 49, 50 |



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Table 17
Percent Mortalities and $LC_{50}$ Values - American Cyanamid Company
Magnifloc 515C - Rainbow Trout

Percent Mortality

| | Control | Test Material, Nominal Conc. mg/l | | | | |
|---|---|---|---|---|---|---|
| | | 18.0 | 32.0 | 56.0 | 100.0 | 180.0 |
| 24 hour | 0% | 0% | 0% | 0% | 0% | 0% |
| 48 hour | 0% | 0% | 0% | 0% | 0% | 0% |
| 96 hour | 0% | 0% | 0% | 10% | 0% | 0% |

$LC_{50}$ Values

| | | 24 Hour | 48 Hour | 96 Hour |
|---|---|---|---|---|
| $LC_{50}$, mg/l | | >180.0 | >180.0 | >180.0 |
| 95% Confidence Limits | Low | N.A. | N.A. | N.A. |
| | High | N.A. | N.A. | N.A. |

Observed 96 hour no effect level (toxicant related): 56.0 mg/l.
Most likely the 10% mortality at 56.0 mg/l is not toxicant related since there are no mortalities at 100.0 or 180.0 mg/l.
N.A. = Not available.

Table 18
Physical and Chemical Parameters - American Cyanamid Company
Magnifloc 515C - Rainbow Trout

Dilution Water

pH: 7.44 Total Hardness: 46 mg/l as $CaCO_3$
Average Temperature: 12.2°C Total Alkalinity: 30 mg/l as $CaCO_3$
Range: 12.0-12.5°C Conductivity: 158 µmhos/cm

Dissolved Oxygen, mg/l

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 18.0 | 56.0 | 180.0 |
| Initial | 9.3 | 9.4 | 9.6 | 9.3 |
| 48 hour | 9.5 | 9.2 | 9.4 | 9.3 |
| 96 hour | 9.4 | 9.0 | 8.9 | 8.9 |

pH

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 18.0 | 56.0 | 180.0 |
| Initial | 7.44 | 7.39 | 7.34 | 7.14 |
| 96 hour | 7.31 | 7.28 | 7.30 | 7.23 |

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| | |
|---|---|
| Client: | American Cyanamid Company |
| Date: | The test was conducted from 27 December through 31 December 1977. |
| Material: | Magnifloc 507C |
| UCES Proj. No. | 11506-47-13 |
| Summary: | The 96 hour $LC_{50}$ is 36.0 mg/l and the observed no effect level is 18.0 mg/l. |
| Species: | Bluegill sunfish, Lepomis macrochirus |
| Length: | 28 mm |
| Weight: | 0.25 grams |
| Biological Loading: | 0.17 g/l |
| Source: | Nebraska |
| 96 Hour $LC_{50}$: | 36.0 mg/l |
| 95% Conf. Limits: | 30.2 - 42.9 mg/l |
| No Effect Level: | 18.0 mg/l |
| Water Quality: | Soft |
| Temperature: | 22 ± 2°C |
| pH: | 7.33 |
| Hardness (as $CaCO_3$): | 38 mg/l |
| 96 Hr. $LC_{50}$ Ref. Toxicant p,p'-DDT: | 4.03 (3.59 - 4.52) µg/l |
| Notebook Reference: | No. 4627, pages 21, 22 |

Table 19
Percent Mortalities and $LC_{50}$ Values - American Cyanamid Company
Magnifloc 507C - Bluegill Sunfish

Percent Mortality

| | Control | Test Material, Nominal Conc. mg/l | | | | |
|---|---|---|---|---|---|---|
| | | 18.0 | 32.0 | 56.0 | 100.0 | 180.0 |
| 24 hour | 0% | 0% | 0% | 50% | 100% | 100% |
| 48 hour | 0% | 0% | 0% | 90% | 100% | 100% |
| 96 hour | 0% | 0% | 30% | 100% | 100% | 100% |

$LC_{50}$ Values

| | | 24 Hour | 48 Hour | 96 Hour |
|---|---|---|---|---|
| $LC_{50}$, mg/l | | 57.0 | 45.3 | 36.0 |
| 95% Confidence Limits | Low | 47.1 | 40.4 | 30.2 |
| | High | 69.1 | 50.8 | 42.9 |

Observed 96 hour no effect level: 18.0 mg/l.

Table 20
Physical and Chemical Parameters - American Cyanamid Company
Magnifloc 507C - Bluegill Sunfish

Dilution Water

pH: 7.33 Total Hardness: 38 mg/l as $CaCO_3$
Average Temperature: 21.3°C Total Alkalinity: 27 mg/l as $CaCO_3$
Range: 21.0-22.0°C Conductivity: 129 µmhos/cm

Dissolved Oxygen, mg/l

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 18.0 | 56.0 | 180.0 |
| Initial | 10.1 | 9.8 | 10.0 | 9.9 |
| 48 hour | 7.8 | 7.9 | 8.7 | * |
| 96 hour | 7.8 | 7.9 | * | * |

pH

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 18.0 | 56.0 | 180.0 |
| Initial | 7.33 | 7.34 | 7.32 | 7.26 |
| 96 hour | 7.21 | 7.26 | * | * |

*Data not collected after 100% mortality.

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| | |
|---|---|
| **Client:** | American Cyanamid Company |
| **Date:** | Six tests were conducted on the following dates:<br>Test 1: 9-13 Jan 1978 Test 2: 16-20 Jan 1978<br>Test 3: 24-28 Jan 1978 Test 4: 9-13 Feb 1978<br>Test 5: 14-18 Feb 1978 Test 6: 20-24 Feb 1978 |
| **Material:** | Magnifloc 507C |
| **UCES Proj. No.:** | 11506-47-14 |
| **Summary:** | The 96 hour $LC_{50}$ of Magnifloc 507C was not calculated due to the variability observed between tests. All tests were performed with nominal concentrations of the chemical in soft reconstituted water. |
| **Species:** | Rainbow trout, Salmo gairdneri |
| **Length:** | Test 1: 51 mm Test 2: 38 mm Test 3: n.a.<br>Test 4: 46 mm Test 5: 44 mm Test 6: 37 mm |
| **Weight:** | Test 1: 1.16 g Test 2: 0.36 g Test 3: n.a.<br>Test 4: 0.77 g Test 5: 0.68 g Test 6: 0.37 g |
| **Biological Loading:** | Test 1: 0.74 g/l Test 2: 0.24 g/l Test 3: n.a.<br>Test 4: 0.51 g/l Test 5: 0.45 g/l Test 6: 0.25 g/l |
| **Source:** | Washington |
| **96 Hour $LC_{50}$:** | See tables |
| **95% Conf. Limits:** | See tables |
| **No Effect Levels:** | Test 1: <18.0 mg/l Test 2: 5.6 mg/l Test 3: n.a.<br>Test 2: 5.6 mg/l Test 3: 10.0 mg/l Test 6: 10.0 mg/l |
| **Water Quality:** | Soft |
| **Temperature:** | Test 1: 12.1±0.5°C Test 2: 12.2±0.5°C<br>Test 3: n.a. Test 4: 12.3±0.5°C<br>Test 5: 12.5±0.5°C Test 6: 12.0±0.5°C |
| **pH:** | Test 1: 7.34 Test 2: 7.47 Test 3: 7.48<br>Test 4: 7.59 Test 5: 7.48 Test 6: 7.58 |
| **Hardness (as $CaCO_3$):** | Test 1: 44 mg/l Test 2: 42 mg/l Test 3: 44 mg/l<br>Test 4: 42 mg/l Test 5: 46 mg/l Test 6: 44 mg/l |
| **96 Hr. $LC_{50}$ Ref. Toxicant p,p'-DDT:** | 10.59 (8.31 - 13.50) µg/l |
| **Notebook Reference:** | No. 4627, pages 83, 84 |

n.a. = Not available.

Table 21
**Percent Mortalities and $LC_{50}$ Values - American Cyanamid Company**
**Magnifloc 507C - Rainbow Trout**

**Test 1**
**9-13 January 1978**

**Percent Mortality**

| | Control | Test Material, Nominal Conc. mg/l | | | | |
|---|---|---|---|---|---|---|
| | | 18.0 | 32.0 | 56.0 | 100.0 | 180.0 |
| 24 hour | 0% | 50% | 60% | 100% | 100% | 100% |
| 48 hour | 0% | 80% | 80% | 100% | 100% | 100% |
| 96 hour | 0% | 80% | 90% | 100% | 100% | 100% |

**$LC_{50}$ Values**

The 96 hour $LC_{50}$ for rainbow trout Test 1 of Magnifloc 507C is less than 18.0 mg/l. The conflicting data observed in the six tests conducted on this compound produce reasonable doubt as to the validity of this value.

Observed 96 hour no effect level: <18.0 mg/l.

Table 22
Physical and Chemical Parameters - American Cyanamid Company
Magnifloc 507C - Rainbow Trout

Test 1
9-13 January 1978

Dilution Water

pH: 7.34
Average Temperature: 12.1°
Range: ±0.5°C

Total Hardness: 44 mg/l as $CaCO_3$
Total Alkalinity: 35 mg/l as $CaCO_3$
Conductivity: 175 µmhos/cm

Dissolved Oxygen, mg/l

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 18.0 | 56.0 | 180.0 |
| Initial | 9.0 | 9.0 | 9.0 | 9.2 |
| 48 hour | 6.5 | 8.[illegible] | * | * |
| 96 hour | 6.1 | 7.9 | * | * |

pH

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 18.0 | 56.0 | 180.0 |
| Initial | 7.34 | 7.34 | 7.32 | 7.24 |
| 96 hour | 6.97 | 7.16 | * | * |

*Data not collected after 100% mortality.

Table 23
Percent Mortalities and $LC_{50}$ Values - American Cyanamid Company
Magnifloc 507C - Rainbow Trout

Test 2
16-20 January 1978

Percent Mortality

| | Control | Test Material, Nominal Conc. mg/l | | | | |
|---|---|---|---|---|---|---|
| | | 5.6 | 10.0 | 18.0 | 32.0 | 56.0 |
| 24 hour | 0% | 0% | 0% | 0% | 0% | 0% |
| 48 hour | 0% | 0% | 0% | 0% | 0% | 10% |
| 96 hour | 0% | 0% | 0% | 0% | 0% | 10% |

$LC_{50}$ Values

The 96 hour $LC_{50}$ value for Test 2 of Magnifloc 507C to rainbow trout is greater than 56.0 mg/l. The validity of this value, however, is questionable when test data for all six Magnifloc 507C rainbow trout tests are compared.

Observed 96 hour no effect level: 5.6 mg/l.

Table 24
Physical and Chemical Parameters - American Cyanamid Company
Magnifloc 507C - Rainbow Trout

Test 2
16-20 January 1978

Dilution Water

pH: 7.47
Average Temperature: 12.2°C
Range: ±0.5°C

Total Hardness: 42 mg/l as $CaCO_3$
Total Alkalinity: 30 mg/l as $CaCO_3$
Conductivity: 149 µmhos/cm

Dissolved Oxygen, mg/l

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 5.6 | 10.0 | 56.0 |
| Initial | 9.2 | 9.2 | 9.3 | 9.5 |
| 48 hour | 8.5 | 9.1 | 8.7 | 8.9 |
| 96 hour | 8.1 | 9.0 | 8.6 | 8.6 |

pH

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 5.6 | 10.0 | 56.0 |
| Initial | 7.47 | 7.47 | 7.47 | 7.46 |
| 96 hour | 7.22 | 7.26 | 7.26 | 7.30 |

Table 25
Percent Mortalities and $LC_{50}$ Values - American Cyanamid Company
Magnifloc 507C - Rainbow Trout

Test 3
24-28 January 1978

Percent Mortality

| | Control | Test Material, Nominal Conc. mg/l | | | | |
|---|---|---|---|---|---|---|
| | | 5.6 | 10.0 | 18.0 | 32.0 | 56.0 |
| 24 hour | 0% | 0% | 0% | 0% | 0% | 0% |
| 48 hour | 0% | 0% | 0% | 0% | 0% | 0% |
| 72 hour | 10% | 20% | 0% | 20% | 10% | 20% |

$LC_{50}$ Values

The 96 hour values for Test 3 of Magnifloc 507C could not be determined. This test was terminated after 72 hours due to irregular mortality patterns. These irregular mortalities were not totally toxicant related as is indicated by the deaths observed in the control.

Table 26
Physical and Chemical Parameters - American Cyanamid Company
Magnifloc 507C - Rainbow Trout

Test 3
24-28 January 1978

Dilution Water

pH: 7.46
Average Temperature: 12.1°C
Range: 10.5°C

Total Hardness: 44 mg/l as $CaCO_3$
Total Alkalinity: 33 mg/l as $CaCO_3$
Conductivity: 150 µmhos/cm

Dissolved Oxygen, mg/l

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 5.6 | 18.0 | 56.0 |
| Initial | 9.2 | 9.3 | 9.1 | 8.8 |
| 48 hour | 9.2 | 8.7 | 9.1 | 9.0 |
| 96 hour | * | * | * | * |

pH

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 5.6 | 18.0 | 56.0 |
| Initial | 7.48 | 7.45 | 7.43 | 7.42 |
| 96 hour | * | * | * | * |

*Data not collected due to termination of test.

Table 27
Percent Mortalities and $LC_{50}$ Values - American Cyanamid Company
Magnifloc 507C - Rainbow Trout

Test 4
9-13 February 1978

Percent Mortality

| | Control | Test Material, Nominal Conc. mg/l | | | | |
|---|---|---|---|---|---|---|
| | | 5.6 | 10.0 | 18.0 | 32.0 | 56.0 |
| 24 hour | 0% | 0% | 0% | 0% | 0% | 0% |
| 48 hour | 0% | 0% | 0% | 0% | 0% | 0% |
| 96 hour | 0% | 0% | 0% | 0% | 10% | 50% |

$LC_{50}$ Values

The 96 hour $LC_{50}$ for Magnifloc 507C Test 4 to rainbow trout is 53.1 mg/l. The validity of this value, however, is questionable when test data for all six Magnifloc 507C rainbow trout tests are compared.

Observed 96 hour no effect level: 5.6 mg/l.

Table 28
Physical and Chemical Parameters - American Cyanamid Company
Magnifloc 507C - Rainbow Trout

Test 4
9-13 February 1978

Dilution Water

pH: 7.59
Average Temperature: 12.3°C
Range: ± 0.5°C

Total Hardness: 42 mg/l as $CaCO_3$
Total Alkalinity: 35 mg/l as $CaCO_3$
Conductivity: 145 µmhos/cm

Dissolved Oxygen, mg/l

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 5.6 | 18.0 | 56.0 |
| Initial | 10.2 | 10.2 | 10.1 | 10.0 |
| 48 hour | 8.5 | 8.4 | 8.3 | 8.3 |
| 96 hour | 8.4 | 8.0 | 8.2 | 8.3 |

pH

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 5.6 | 18.0 | 56.0 |
| Initial | 7.59 | 7.58 | 7.58 | 7.45 |
| 96 hour | 7.28 | 7.24 | 7.28 | 7.23 |

Table 29
Percent Mortalities and $LC_{50}$ Values - American Cyanamid Company
Magnifloc 507C - Rainbow Trout

Test 5
14-18 February 1978

Percent Mortality

| | Control | Test Material, Nominal Conc. mg/l | | | | |
|---|---|---|---|---|---|---|
| | | 10.0 | 18.0 | 32.0 | 56.0 | 100.0 |
| 24 hour | 0% | 0% | 0% | 0% | 0% | 0% |
| 48 hour | 0% | 0% | 0% | 10% | 20% | 30% |
| 96 hour | 0% | 0% | 0% | 80% | 100% | 90% |

$LC_{50}$ Values

The 96 hour $LC_{50}$ for Magnifloc 507C Test 5 to rainbow trout is 28.2 mg/l. The validity of this value, however, is questionable when data from all six Magnifloc 507C tests are compared.

Observed 96 hour no effect level:

Table 30
Physical and Chemical Parameters - American Cyanamid Company
Magnifloc 507C - Rainbow Trout

Test 5
14-18 February 1978

Dilution Water

pH: 7.48
Average Temperature: 12.5°C
Range: ±0.5°C

Total Hardness: 46 mg/l as $CaCO_3$
Total Alkalinity: 35 mg/l as $CaCO_3$
Conductivity: 195 µmhos/cm

Dissolved Oxygen, mg/l

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 10.0 | 32.0 | 100.0 |
| Initial | 8.9 | 9.1 | 8.9 | 9.1 |
| 48 hour | 8.9 | 7.7 | 8.0 | 8.2 |
| 96 hour | 8.8 | 7.7 | 8.5 | 9.0 |

pH

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 10.0 | 32.0 | 100.0 |
| Initial | 7.48 | 7.48 | 7.47 | 7.42 |
| 96 hour | 7.27 | 7.20 | 7.41 | 7.49 |

Table 31
Percent Mortalities and $LC_{50}$ Values - American Cyanamid Company
Magnifloc 507C - Rainbow Trout

Test 6
20-24 March 1978

Percent Mortality

| | Control | Test Material, Nominal Conc. mg/l | | | | |
|---|---|---|---|---|---|---|
| | | 10.0 | 18.0 | 32.0 | 56.0 | 100.0 |
| 24 hour | 0% | 0% | 0% | 0% | 0% | 0% |
| 48 hour | 0% | 0% | 0% | 0% | 0% | 10% |
| 96 hour | 0% | 0% | 0% | 0% | 20% | 40% |

$LC_{50}$ Values

The 96 hour $LC_{50}$ for Magnifloc 507C Test 6 to rainbow trout is greater than 100 mg/l. The validity of this value, however, is questionable when test data for all six Magnifloc 507C rainbow trout tests are compared.

Observed 96 hour no effect level: 10.0 mg/l.

Table 32
Physical and Chemical Parameters - American Cyanamid Company
Magnifloc 507C - Rainbow Trout

Test 6
20-24 March 1978

Dilution Water

pH: 7.58
Average Temperature: 12.0°C
Range: ±0.5°C

Total Hardness: 44 mg/l as $CaCO_3$
Total Alkalinity: 30 mg/l as $CaCO_3$
Conductivity: 175 µmhos/cm

Dissolved Oxygen, mg/l

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 10.0 | 32.0 | 100.0 |
| Initial | 9.1 | 9.1 | 8.9 | 9.2 |
| 48 hour | 8.3 | 8.3 | 8.6 | 8.4 |
| 96 hour | 8.3 | 8.1 | 8.5 | 8.4 |

pH

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 10.0 | 32.0 | 100.0 |
| Initial | 7.58 | 7.49 | 7.50 | 7.42 |
| 96 hour | 7.39 | 7.33 | 7.43 | 7.49 |

**Table 33**
**Comparative Mortality Values - American Cyanamid Company**
**Magnifloc 507C - Rainbow Trout**
**Percent Mortalities**

Test 1
9-13 Jan 1978

| | Test Material, Nominal Conc. mg/l | | | | | |
|---|---|---|---|---|---|---|
| | Control | 18.0 | 32.0 | 56.0 | 100.0 | 180.0 |
| 24 hour | 0% | 50% | 60% | 100% | 100% | 100% |
| 48 hour | 0% | 80% | 80% | 100% | 100% | 100% |
| 96 hour | 0% | 80% | 90% | 100% | 100% | 100% |

Test 2
16-20 Jan 1978

| | Test Material, Nominal Conc. mg/l | | | | | |
|---|---|---|---|---|---|---|
| | Control | 5.6 | 10.0 | 18.0 | 32.0 | 56.0 |
| 24 hour | 0% | 0% | 0% | 0% | 0% | 0% |
| 48 hour | 0% | 0% | 0% | 0% | 0% | 10% |
| 96 hour | 0% | 0% | 0% | 0% | 0% | 10% |

Test 3
24-28 Jan 1978

| | Test Material, Nominal Conc. mg/l | | | | | |
|---|---|---|---|---|---|---|
| | Control | 5.6 | 10.0 | 18.0 | 32.0 | 56.0 |
| 24 hour | 0% | 0% | 0% | 0% | 0% | 0% |
| 48 hour | 0% | 0% | 0% | 0% | 0% | 0% |
| 72 hour | 10% | 20% | 0% | 20% | 10% | 20% |

Test 4
9-13 Feb 1978

| | Test Material, Nominal Conc. mg/l | | | | | |
|---|---|---|---|---|---|---|
| | Control | 5.6 | 10.0 | 18.0 | 32.0 | 56.0 |
| 24 hour | 0% | 0% | 0% | 0% | 0% | 0% |
| 48 hour | 0% | 0% | 0% | 0% | 0% | 0% |
| 96 hour | 0% | 0% | 0% | 0% | 10% | 50% |

Test 5
14-18 Feb 1978

| | Test Material, Nominal Conc. mg/l | | | | | |
|---|---|---|---|---|---|---|
| | Control | 10.0 | 18.0 | 32.0 | 56.0 | 100.0 |
| 24 hour | 0% | 0% | 0% | 0% | 0% | 0% |
| 48 hour | 0% | 0% | 0% | 10% | 20% | 30% |
| 96 hour | 0% | 0% | 0% | 80% | 100% | 90% |

Test 6
20-24 Mar 1978

| | Test Material, Nominal Conc. mg/l | | | | | |
|---|---|---|---|---|---|---|
| | Control | 10.0 | 18.0 | 32.0 | 56.0 | 100.0 |
| 24 hour | 0% | 0% | 0% | 0% | 0% | 0% |
| 48 hour | 0% | 0% | 0% | 0% | 0% | 10% |
| 96 hour | 0% | 0% | 0% | 0% | 20% | 40% |

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| | |
|---|---|
| Client: | American Cyanamid Company |
| Date: | The test was conducted from 27 December through 31 December 1977. |
| Material: | Magnifloc 521C |
| UCES Proj. No. | 11506-47-17 |
| Summary: | The 96 hour $LC_{50}$ is 1.2 mg/l and the observed no effect level is 0.56 mg/l. |

| | |
|---|---|
| Species: | Bluegill sunfish, Lepomis macrochirus |
| Length: | 29 mm |
| Weight: | 0.30 grams |
| Biological Loading: | 0.20 g/l |
| Source: | Nebraska |
| 96 Hour $LC_{50}$: | 1.2 mg/l |
| 95% Conf. Limits: | 1.0 - 1.4 mg/l |
| No Effect Level: | 0.56 mg/l |
| Water Quality: | Soft |
| Temperature: | 22.0 ± 2°C |
| pH: | 7.35 |
| Hardness (as $CaCO_3$): | 38 mg/l |
| 96 Hr. $LC_{50}$ Ref. Toxicant p,p'-DDT: | 4.03 (3.59 - 4.52) µg/l |
| Notebook Reference: | No. 4627, pages 19, 20 |

Table 34
Percent Mortalities and $LC_{50}$ Values - American Cyanamid Company
Magnifloc 521C - Bluegill Sunfish

Percent Mortality

| | Control | Test Material, Nominal Conc. mg/l | | | | |
|---|---|---|---|---|---|---|
| | | 0.56 | 1.00 | 1.80 | 2.20 | 5.60 |
| 24 hour | 0% | 0% | 10% | 70% | 100% | 100% |
| 48 hour | 0% | 0% | 10% | 90% | 100% | 100% |
| 96 hour | 0% | 0% | 20% | 100% | 100% | 100% |

$LC_{50}$ Values

| | | 24 Hour | 48 Hour | 96 Hour |
|---|---|---|---|---|
| $LC_{50}$, mg/l | | 1.5 | 1.3 | 1.2 |
| 95% Confidence Limits | Low | 1.2 | 1.1 | 1.0 |
| | High | 1.8 | 1.6 | 1.4 |

Observed 96 hour no effect level: 0.56 mg/l.

Table 35
Physical and Chemical Parameters - American Cyanamid Company
Magnifloc 521C - Bluegill Sunfish

Dilution Water

pH: 7.35 Total Hardness: 38 mg/l as $CaCO_3$
Average Temperature: 21.3°C Total Alkalinity: 27 mg/l as $CaCO_3$
Range: 21.0-22.0°C Conductivity: 129 µmhos/cm

Dissolved Oxygen, mg/l

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 0.56 | 1.80 | 5.60 |
| Initial | 10.1 | 10.0 | 9.8 | 9.5 |
| 48 hour | 7.6 | 7.7 | 8.5 | * |
| 96 hour | 7.7 | 7.7 | * | * |

pH

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 0.56 | 1.80 | 5.60 |
| Initial | 7.35 | 7.36 | 7.35 | 7.34 |
| 96 hour | 7.23 | 7.26 | * | * |

*Data not collected after 100% mortality.

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| | |
|---|---|
| Client: | American Cyanamid Company |
| Date: | The test was conducted from 7 January through 13 January 1978. |
| Material: | Magnifloc 521C |
| UCES Proj. No.: | 11506-47-18 |
| Summary: | The 96 hour $LC_{50}$ is 0.57 mg/l and the observed no effect level is 0.18 mg/l. |

| | | |
|---|---|---|
| Species: | Rainbow trout, Salmo gairdneri | |
| Length: | Data not collected | (For approximate values see 11506-47-8 report) |
| Weight: | Data not collected | |
| Biological Loading: | Data not collected | |
| Source: | Washington | |
| 96 Hour $LC_{50}$: | 0.57 mg/l | |
| 95% Conf. Limits: | 0.46 - 0.71 mg/l | |
| No Effect Level: | 0.18 mg/l | |
| Water Quality: | Soft | |
| Temperature: | 12 ± 2°C | |
| pH: | 7.31 | |
| Hardness (as $CaCO_3$): | 44 mg/l | |
| 96 Hr. $LC_{50}$ Ref. Toxicant p,p'-DDT: | 10.59 (8.31 - 13.50) µg/l | |

Notebook Reference: No. 4627, pages 35, 36



0 0 4 8

Table 36
**Percent Mortalities and $LC_{50}$ Values - American Cyanamid Company**
**Magnifloc 521C - Rainbow Trout**

**Percent Mortality**

| | Control | Test Material, Nominal Conc. mg/l | | | | |
|---|---|---|---|---|---|---|
| | | 0.18 | 0.32 | 0.56 | 1.00 | 1.80 |
| 24 hour | 0% | 0% | 0% | 0% | 40% | 100% |
| 48 hour | 0% | 0% | 10% | 20% | 80% | 100% |
| 96 hour | 0% | 0% | 10% | 40% | 100% | 100% |

$LC_{50}$ Values

| | | 24 Hour | 48 Hour | 96 Hour |
|---|---|---|---|---|
| $LC_{50}$, mg/l | | 1.08 | 0.72 | 0.57 |
| 95% Confidence Limits | Low | 0.89 | 0.56 | 0.46 |
| | High | 1.30 | 0.92 | 0.71 |

Observed 96 hour no effect level: 0.18 mg/l.

Table 37
Physical and Chemical Parameters - American Cyanamid Company
Magnifloc 521C - Rainbow Trout

Dilution Water

pH: 7.31 Total Hardness: 44 mg/l as $CaCO_3$
Average Temperature: 12.1°C Total Alkalinity: 35 mg/l as $CaCO_3$
Range: 12.0-12.3°C Conductivity: 175 µmhos/cm

Dissolved Oxygen, mg/l

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 0.18 | 0.56 | 1.80 |
| Initial | 9.1 | 9.1 | 8.9 | 9.2 |
| 48 hour | 7.9 | 7.5 | 5.9 | * |
| 96 hour | 7.3 | 6.9 | 7.1 | * |

pH

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 0.18 | 0.56 | 1.80 |
| Initial | 7.31 | 7.36 | 7.36 | 7.38 |
| 96 hour | 7.08 | 7.01 | 7.05 | * |

*Data not collected after 100% mortality.

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| | |
|---|---|
| Client: | American Cyanamid Company |
| Date: | The test was conducted from 7 December through 11 December 1977. |
| Material: | Magnifloc 2535C |
| UCES Proj. No. | 11506-47-1 |
| Summary: | The 96 hour $LC_{50}$ is 17.7 mg/l and the observed no effect level is 5.6 mg/l. |

| | |
|---|---|
| Species: | Bluegill sunfish, *Lepomis macrochirus* |
| Length: | 37 mm |
| Weight: | 0.57 grams |
| Biological Loading: | 0.38 g/l |
| Source: | Nebraska |
| 96 Hour $LC_{50}$: | 17.7 mg/l |
| 95% Conf. Limits: | 14.6 - 21.5 mg/l |
| No Effect Level: | 5.6 mg/l |
| Water Quality: | Soft |
| Temperature: | 22.4°C |
| pH: | 7.51 |
| Hardness (as $CaCO_3$): | 44 mg/l |
| 96 Hr. $LC_{50}$ Ref. Toxicant p,p'-DDT: | 4.03 (3.59 - 4.52) µg/l |
| Notebook Reference: | No. 4627, pages 7, 8 |

Table 38
Percent Mortalities and $LC_{50}$ Values - American Cyanamid Company
Magnifloc 2535C - Bluegill Sunfish

Percent Mortality

| | Control | Test Material, Nominal Conc. mg/l | | | | |
|---|---|---|---|---|---|---|
| | | 5.6 | 10.0 | 18.0 | 32.0 | 56.0 |
| 24 hour | 0% | 0% | 0% | 10% | 90% | 100% |
| 48 hour | 0% | 0% | 0% | 50% | 100% | 100% |
| 96 hour | 0% | 0% | 0% | 50% | 100% | 100% |

$LC_{50}$ Values

| | | 24 Hour | 48 Hour | 96 Hour |
|---|---|---|---|---|
| $LC_{50}$, mg/l | | 23.7 | 17.7 | 17.7 |
| 95% Confidence Limits | Low | 20.1 | 14.6 | 14.6 |
| | High | 27.9 | 21.5 | 21.5 |

Observed 96 hour no effect level: 5.6 mg/l.

Table 39
Physical and Chemical Parameters - American Cyanamid Company
Magnifloc 2535C - Bluegill Sunfish

Dilution Water

pH: 7.51 Total Hardness: 44 mg/l as $CaCO_3$
Average Temperature: 22.4°C Total Alkalinity: 23 mg/l as $CaCO_3$
Range: 22.2-22.5°C Conductivity: 156 µmhos/cm

Dissolved Oxygen, mg/l

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 5.6 | 18.0 | 56.0 |
| Initial | 8.8 | 8.9 | 8.9 | 8.8 |
| 48 hour | 6.3 | 6.4 | 7.2 | * |
| 96 hour | 6.1 | 5.9 | 7.0 | * |

pH

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 5.6 | 18.0 | 56.0 |
| Initial | 7.51 | 7.53 | 7.57 | 7.63 |
| 96 hour | 7.18 | 7.13 | 7.32 | * |

*Data not collected after 100% mortality.

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| | |
|---|---|
| Client: | American Cyanamid Company |
| Date: | The test was conducted from 7 December through 11 December 1977. |
| Material: | Magnifloc 2535C |
| UCES Proj. No.: | 11506-47-2 |
| Summary: | The 96 hour $LC_{50}$ is 3.35 mg/l and the observed no effect level is 1.00 mg/l. |
| Species: | Rainbow trout, *Salmo gairdneri* |
| Length: | 40 mm |
| Weight: | 0.48 grams |
| Biological Loading: | 0.32 g/l |
| Source: | Washington |
| 96 Hour $LC_{50}$: | 3.35 mg/l |
| 95% Conf. Limits: | 2.77 - 4.04 mg/l |
| No Effect Level: | 1.00 mg/l |
| Water Quality: | Soft |
| Temperature: | 12.3°C |
| pH: | 7.59 |
| Hardness (as $CaCO_3$): | 44 mg/l |
| 96 Hr. $LC_{50}$ Ref. Toxicant p,p'-DDT: | 10.59 (8.31 - 13.50) µg/l |
| Notebook Reference: | No. 4627, pages 9, 10 |



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**Table 40**
**Percent Mortalities and $LC_{50}$ Values - American Cyanamid Company**
**Magnifloc 2535C - Rainbow Trout**

**Percent Mortality**

| | Control | Test Material, Nominal Conc. mg/l | | | | |
|---|---|---|---|---|---|---|
| | | 0.56 | 1.00 | 1.80 | 3.20 | 5.60 |
| 24 hour | 0% | 0% | 0% | 0% | 0% | 30% |
| 48 hour | 10% | 0% | 0% | 0% | 20% | 100% |
| 96 hour | 10% | 0% | 0% | 0% | 40% | 100% |

**$LC_{50}$ Values**

| | | 24 Hour | 48 Hour | 96 Hour |
|---|---|---|---|---|
| $LC_{50}$, mg/l | | >5.60 | 3.75 | 3.35 |
| 95% Confidence Limits | Low | N.A. | 3.22 | 2.77 |
| | High | N.A. | 4.38 | 4.04 |

Observed 96 hour no effect level: 1.00 mg/l.
N.A. = Not available.

Table 41
Physical and Chemical Parameters - American Cyanamid Company
Magnifloc 2535C - Rainbow Trout

Dilution Water

pH: 7.59 Total Hardness: 44 mg/l as $CaCO_3$
Average Temperature: 12.3°C Total Alkalinity: 23 mg/l as $CaCO_3$
Range: 11.9-12.5°C Conductivity: 156 µmhos/cm

Dissolved Oxygen, mg/l

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 0.56 | 1.80 | 5.60 |
| Initial | 9.3 | 9.4 | 9.4 | 9.5 |
| 48 hour | 8.9 | 9.1 | 8.9 | 8.9 |
| 96 hour | 8.8 | 9.0 | 8.5 | * |

pH

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 0.56 | 1.80 | 5.60 |
| Initial | 7.59 | 7.58 | 7.57 | 7.60 |
| 96 hour | 7.30 | 7.32 | 7.28 | * |

*Data not collected after 100% mortality.

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| | |
|---|---|
| Client: | American Cyanamid Company |
| Date: | The test was conducted from 27 December through 31 December 1977. |
| Material: | Magnifloc 567C |
| UCES Proj. No. | 11506-47-19 |
| Summary: | The 96 hour $LC_{50}$ is 1.3 mg/l and the observed no effect level is less than 1.0 mg/l. |
| Species: | Bluegill sunfish, Lepomis macrochirus |
| Length: | 28 mm |
| Weight: | 0.27 grams |
| Biological Loading: | 0.18 g/l |
| Source: | Nebraska |
| 96 Hour $LC_{50}$: | 1.3 mg/l |
| 95% Conf. Limits: | 1.1 - 1.4 mg/l |
| No Effect Level: | <1.0 mg/l |
| Water Quality: | Soft |
| Temperature: | 22 ± 2°C |
| pH: | 7.33 |
| Hardness (as $CaCO_3$): | 38 mg/l |
| 96 Hr. $LC_{50}$ Ref. Toxicant p,p'-DDT: | 4.03 (3.59 - 4.52) µg/l |
| Notebook Reference: | No. 4627, pages 23, 24 |

Table 42
Percent Mortalities and $LC_{50}$ Values - American Cyanamid Company
Magnifloc 567C - Bluegill Sunfish

Percent Mortality

| | Control | Test Material, Nominal Conc. mg/l | | | | |
|---|---|---|---|---|---|---|
| | | 1.0 | 1.8 | 3.2 | 5.6 | 10.0 |
| 24 hour | 0% | 0% | 20% | 60% | 90% | 100% |
| 48 hour | 0% | 0% | 70% | 100% | 100% | 100% |
| 96 hour | 0% | 10% | 100% | 100% | 100% | 100% |

$LC_{50}$ Values

| | | 24 Hour | 48 Hour | 96 Hour |
|---|---|---|---|---|
| $LC_{50}$, mg/l | | 2.8 | 1.6 | 1.3 |
| 95% Confidence Limits | Low | 2.2 | 1.3 | 1.1 |
| | High | 3.7 | 1.9 | 1.4 |

Observed 96 hour no effect level: <1.0 mg/l.

Table 43
Physical and Chemical Parameters - American Cyanamid Company
Magnifloc 567C - Bluegill Sunfish

Dilution Water

pH: 7.33 Total Hardness: 38 mg/l as $CaCO_3$
Average Temperature: 21.3°C Total Alkalinity: 27 mg/l as $CaCO_3$
Range: 21.0-22.0°C Conductivity: 129 µmhos/cm

Dissolved Oxygen, mg/l

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 1.0 | 3.2 | 10.0 |
| Initial | 9.8 | 10.0 | 10.1 | 10.0 |
| 48 hour | 8.0 | 7.8 | 9.0 | * |
| 96 hour | 7.9 | 7.3 | * | * |

pH

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 1.0 | 3.2 | 10.0 |
| Initial | 7.33 | 7.33 | 7.32 | 7.33 |
| 96 hour | 7.24 | 7.20 | * | * |

*Data not collected after 100% mortality.

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| | |
|---|---|
| Client: | American Cyanamid Company |
| Dates: | Six tests were conducted on the following dates:<br>Test 1: 3- 7 Jan 1978 Test 2: 24-26 Jan 1978<br>Test 3: 9-13 Feb 1978 Test 4: 14-18 Feb 1978<br>Test 5: 27 Feb-3 Mar 1978 Test 6: 20-24 Mar 1978 |
| Material: | Magnifloc 567C |
| UCES Proj. No.: | 11506-47-20 |
| Summary: | The 96 hour $LC_{50}$ of Magnifloc 567C was not calculated due to the variability observed between tests. All tests were performed with nominal concentrations of the chemical in soft reconstituted water. |
| Species: | Rainbow trout, Salmo gairdneri |
| Length: | Test 1: 49 mm Test 2: n.a. Test 3: 42 mm<br>Test 4: 45 mm Test 5: 52 mm Test 6: 37 mm |
| Weight: | Test 1: 0.97 g Test 2: n.a. Test 3: 0.55 g<br>Test 4: 0.72 g Test 5: 1.1 g Test 6: 0.36 g |
| Biological Loading: | Test 1: 0.65 g/l Test 2: n.a. Test 3: 0.37 g/l<br>Test 4: 0.48 g/l Test 5: 0.73 g/l Test 6: 0.24 g/l |
| Source: | Washington |
| 96 Hour $LC_{50}$: | See tables |
| 95% Conf. Limits: | See tables |
| No Effect Levels: | Test 1: 0.18mg/l Test 2: n.a. Test 3:<0.10mg/l<br>Test 4: 0.018mg/l Test 5: 0.056mg/l Test 6:<0.01mg/l |
| Water Quality: | Soft |
| Temperature: | Test 1: 12.1±0.5°C Test 2: 12.1±0.5°C<br>Test 3: 12.3±0.5°C Test 4: 12.5±015°C<br>Test 5: 12.0±0.5°C Test 6: 12.0±0.5°C |
| pH: | Test 1: 7.52 Test 2: 7.46 Test 3: 7.58<br>Test 3: 7.54 Test 5: 7.44 Test 6: 7.58 |
| Hardness (as $CaCO_3$): | Test 1: 42 mg/l Test 2: 44 mg/l Test 3: 42 mg/l<br>Test 4: 46 mg/l Test 5: 44 mg/l Test 6: 46 mg/l |
| 96 Hr. $LC_{50}$ Ref. Toxicant p,p'-DDT: | 10.59 (8.31 - 13.50) µg/l |
| Notebook Reference: | No. 4627, pages 81, 82 |

n.a. = Not available.

Table 44
Percent Mortalities and $LC_{50}$ Values - American Cyanamid Company
Magnifloc 567C - Rainbow Trout

Test 1
3-7 January 1978

Percent Mortality

| | Control | Test Material, Nominal Conc. mg/l | | | | |
|---|---|---|---|---|---|---|
| | | 0.10 | 0.18 | 0.32 | 0.56 | 1.00 |
| 24 hour | 0% | 0% | 0% | 0% | 0% | 0% |
| 48 hour | 0% | 0% | 10% | 70% | 50% | 0% |
| 96 hour | 0% | 0% | 10% | 80% | 80% | 80% |

$LC_{50}$ Values

The 96 hour $LC_{50}$ values for Test 1 on rainbow trout are between 0.18 mg/l and 0.32 mg/l. The validity of these values, however, are questionable when test data for Tests 1-6 are compared for Magnifloc 567C.

Observed 96 hour no effect level: 0.18 mg/l.

Table 45
Physical and Chemical Parameters - American Cyanamid Company
Magnifloc 567C - Rainbow Trout

Test 1
3-7 January 1978

Dilution Water

pH: 7.52
Average Temperature: 12.1°C
Range: ±0.5°C

Total Hardness: 42 mg/l as $CaCO_3$
Total Alkalinity: 31 mg/l as $CaCO_3$
Conductivity: 135 µmhos/cm

Dissolved Oxygen, mg/l

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 0.10 | 0.32 | 1.00 |
| Initial | 8.8 | 9.1 | 9.3 | 9.3 |
| 48 hour | 7.4 | 7.6 | 7.2 | 5.7 |
| 96 hour | 7.4 | 7.5 | 8.2 | 6.0 |

pH

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 0.10 | 0.32 | 1.00 |
| Initial | 7.52 | 7.66 | 7.66 | 7.67 |
| 96 hour | 7.06 | 7.09 | 7.19 | 7.04 |

Table 46
Percent Mortalities and $LC_{50}$ Values - American Cyanamid Company
Magnifloc 567C - Rainbow Trout

Test 2
24-26 January 1978

Percent Mortality

| | Control | Test Material, Nominal Conc. mg/l | | | | |
|---|---|---|---|---|---|---|
| | | 0.10 | 0.16 | 0.32 | 0.56 | 1.00 |
| 24 hour | 20% | 0% | 10% | 0% | 0% | 10% |
| 48 hour | 20% | 20% | 60% | 100% | 70% | N.A. |
| 96 hour | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. |

$LC_{50}$ Values

The 96 hour $LC_{50}$ for rainbow trout Test 2 with Magnifloc 567C is not available due to the early termination of the test. The test was terminated at the 48 hour test period due to the 20% mortalities seen in the control (as well as erratic mortality patterns).

Observed 96 hour no effect level: Not available due to early termination of the test.
N.A. = Not available due to early termination of the test.

Table 47
Physical and Chemical Parameters - American Cyanamid Company
Magnifloc 567C - Rainbow Trout

Test 2
24-26 January 1978

Dilution Water

pH: 7.46
Average Temperature: 12.1°C
Range: ±0.5°C

Total Hardness: 44 mg/l as $CaCO_3$
Total Alkalinity: 33 mg/l as $CaCO_3$
Conductivity: 150 µmhos/cm

Dissolved Oxygen, mg/l

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 0.10 | 0.32 | 1.00 |
| Initial | 8.8 | 8.8 | 9.2 | 9.0 |
| 48 hour | * | * | * | * |
| 96 hour | * | * | * | * |

pH

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 0.10 | 0.32 | 1.00 |
| Initial | 7.46 | 7.51 | 7.50 | 7.49 |
| 96 hour | * | * | * | * |

*Data not collected due to early termination of test.

Table 48
Percent Mortalities and $LC_{50}$ Values - American Cyanamid Company
Magnifloc 567C - Rainbow Trout

Test 3
9-13 February 1978

Percent Mortality

| | Control | Test Material, Nominal Conc. mg/l | | | | |
|---|---|---|---|---|---|---|
| | | 0.10 | 0.18 | 0.32 | 0.56 | 1.00 |
| 24 hour | 0% | 20% | 10% | 10% | 100% | 100% |
| 48 hour | 0% | 80% | 80% | 100% | 100% | 100% |
| 96 hour | 0% | 100% | 100% | 100% | 100% | 100% |

$LC_{50}$ Values

The 96 hour $LC_{50}$ for Magnifloc 567C to rainbow trout is less than 0.10 mg/l. The validity of this value, however, is questionable when test data for Tests 1-6 are compared for Magnifloc 567C.

Observed 96 hour no effect level: <0.10 mg/l.

Table 49
Physical and Chemical Parameters - American Cyanamid Company
Magnifloc 567C - Rainbow Trout

Test 3
9-13 February 1978

Dilution Water

pH: 7.58
Average Temperature: 12.3°C
Range: ±0.5°C

Total Hardness: 42 mg/l as $CaCO_3$
Total Alkalinity: 35 mg/l as $CaCO_3$
Conductivity: 145 µmhos/cm

Dissolved Oxygen, mg/l

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 0.10 | 0.32 | 1.00 |
| Initial | 10.2 | 10.2 | 10.3 | 10.2 |
| 48 hour | 9.1 | 9.1 | 9.2 | * |
| 96 hour | 8.7 | 8.6 | * | * |

pH

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 0.10 | 0.32 | 1.00 |
| Initial | 7.58 | 7.58 | 7.57 | 7.51 |
| 96 hour | 7.34 | 7.37 | * | * |

*Data not collected after 100% mortality has occurred.

Table 50
Percent Mortalities and $LC_{50}$ Values - American Cyanamid Company
Magnifloc 567C - Rainbow Trout

Test 4
14-18 January 1978

Percent Mortality

| | Control | Test Material, Nominal Conc. mg/l | | | | |
|---|---|---|---|---|---|---|
| | | 0.018 | 0.032 | 0.056 | 0.100 | 0.180 |
| 24 hour | 0% | 0% | 10% | 60% | 40% | 40% |
| 48 hour | 0% | 0% | 100% | 100% | 100% | 100% |
| 96 hour | 0% | 0% | 100% | 100% | 100% | 100% |

$LC_{50}$ Values

The 96 hour $LC_{50}$ of Magnifloc 567C Test 4 to rainbow trout is 0.024 mg/l. The validity of this value, however, is questionable when the data from Tests 1-6 are compared for this compound.

Observed 96 hour no effect level: 0.018mg/l.

Table 51
Physical and Chemical Parameters - American Cyanamid Company
Magnifloc 567C - Rainbow Trout

Test 4
14-18 January 1978

Dilution Water

pH: 7.54
Average Temperature: 12.5°C
Range: ±0.5°C

Total Hardness: 46 mg/l as $CaCO_3$
Total Alkalinity: 35 mg/l as $CaCO_3$
Conductivity: 195 µmhos/cm

Dissolved Oxygen, mg/l

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 0.018 | 0.056 | 0.180 |
| Initial | 8.9 | 8.9 | 8.9 | 8.9 |
| 48 hour | 8.0 | 7.8 | 9.4 | 9.2 |
| 96 hour | 8.7 | 8.3 | * | * |

pH

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 0.018 | 0.056 | 0.180 |
| Initial | 7.54 | 7.49 | 7.47 | 7.48 |
| 96 hour | 7.33 | 7.30 | * | * |

*Data not collected after 100% mortality has occurred.

Table 52
Percent Mortalities and $LC_{50}$ Values - American Cyanamid Company
Magnifloc 567C - Rainbow Trout

Test 5
27 Feb-3 Mar 1978

Percent Mortality

| | Control | Test Material, Nominal Conc. mg/l | | | | |
|---|---|---|---|---|---|---|
| | | 0.0056 | 0.0100 | 0.0180 | 0.0320 | 0.0560 |
| 24 hour | 0% | 0% | 0% | 0% | 0% | 0% |
| 48 hour | 0% | 0% | 0% | 0% | 0% | 0% |
| 96 hour | 0% | 0% | 0% | 0% | 0% | 0% |

$LC_{50}$ Values

The 96 hour $LC_{50}$ for Test 5 of Magnifloc 567C to rainbow trout is <0.0560 mg/l. The validity of this value, however, is questionable when the data from Tests 1-6 are compared for this compound.

Observed 96 hour no effect level: 0.0560 mg/l.

Table 53
Physical and Chemical Parameters - American Cyanamid Company
Magnifloc 567C - Rainbow Trout

Test 5
27 Feb-3 Mar 1978

Dilution Water

pH: 7.44
Average Temperature: 12.0°C
Range: ±0.5°C

Total Hardness: 44 mg/l as $CaCO_3$
Total Alkalinity: 31 mg/l as $CaCO_3$
Conductivity: 175 µmhos/cm

Dissolved Oxygen, mg/l

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 0.0056 | 0.0180 | 0.0560 |
| Initial | 9.3 | 9.1 | 9.4 | 9.4 |
| 48 hour | 8.0 | 8.3 | 8.1 | 7.7 |
| 96 hour | 7.6 | 7.6 | 8.0 | 7.0 |

pH

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 0.0056 | 0.0180 | 0.0560 |
| Initial | 7.44 | 7.45 | 7.46 | 7.44 |
| 96 hour | 7.17 | 7.16 | 7.20 | 7.14 |

Table 54
Percent Mortalities and $LC_{50}$ Values - American Cyanamid Company
Magnifloc 567C - Rainbow Trout

Test 6
20-24 March 1978

Percent Mortality

| | Control | Test Material, Nominal Conc. mg/l | | | | |
|---|---|---|---|---|---|---|
| | | 0.010 | 0.018 | 0.032 | 0.056 | 0.100 |
| 24 hour | 0% | 30% | 40% | 30% | 20% | 20% |
| 48 hour | 0% | 60% | 100% | 90% | 100% | 100% |
| 96 hour | 0% | 70% | 100% | 100% | 100% | 100% |

$LC_{50}$ Values

The 96 hour $LC_{50}$ for Test 6 of Magnifloc 567C to rainbow trout is less than 0.010 mg/l. The validity of this value, however, is questionable when the data from Tests 1-6 are compared for this compound.

Observed 96 hour no effect level: <0.010 mg/l.

Table 55
Physical and Chemical Parameters - American Cyanamid Company
Magnifloc 567C - Rainbow Trout

Test 6
20-24 March 1978

Dilution Water

pH: 7.58
Average Temperature: 12.0°C
Range: ±0.5°C

Total Hardness: 46 mg/l as $CaCO_3$
Total Alkalinity: 32 mg/l as $CaCO_3$
Conductivity: 141 µmhos/cm

Dissolved Oxygen, mg/l

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 0.010 | 0.032 | 0.100 |
| Initial | 9.7 | 10.0 | 9.3 | 9.5 |
| 48 hour | 8.2 | 8.7 | 8.8 | 9.0 |
| 96 hour | 8.2 | 8.7 | * | * |

pH

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 0.010 | 0.032 | 0.100 |
| Initial | 7.58 | 7.42 | 7.50 | 7.45 |
| 96 hour | 7.44 | 7.54 | * | * |

*Data not collected after 100% mortality.

**Table 56**
**Comparative Mortality Values - American Cyanamid Company**
**Magnifloc 567C - Rainbow Trout**
**Percent Mortalities**

| Test 1<br>3-7 Jan 1978 | Test Material, Nominal Conc. mg/l | | | | | |
|---|---|---|---|---|---|---|
| | Control | 0.10 | 0.18 | 0.32 | 0.56 | 1.00 |
| 24 hour | 0% | 0% | 0% | 0% | 0% | 0% |
| 48 hour | 0% | 0% | 10% | 70% | 50% | 0% |
| 96 hour | 0% | 0% | 10% | 80% | 80% | 80% |

| Test 2<br>24-26 Jan 1978 | Test Material, Nominal Conc. mg/l | | | | | |
|---|---|---|---|---|---|---|
| | Control | 0.10 | 0.18 | 0.32 | 0.56 | 1.00 |
| 24 hour | 20% | 0% | 10% | 0% | 0% | 10% |
| 48 hour | 20% | 20% | 60% | 100% | 70% | * |

*Not collected; test terminated at 48 hour period.

| Test 3<br>9-13 Feb 1978 | Test Material, Nominal Conc. mg/l | | | | | |
|---|---|---|---|---|---|---|
| | Control | 0.10 | 0.18 | 0.32 | 0.56 | 1.00 |
| 24 hour | 0% | 20% | 10% | 10% | 100% | 100% |
| 48 hour | 0% | 80% | 80% | 100% | 100% | 100% |
| 96 hour | 0% | 100% | 100% | 100% | 100% | 100% |

| Test 4<br>14-18 Feb 1978 | Test Material, Nominal Conc. mg/l | | | | | |
|---|---|---|---|---|---|---|
| | Control | 0.018 | 0.032 | 0.056 | 0.100 | 0.180 |
| 24 hour | 0% | 0% | 10% | 60% | 40% | 40% |
| 48 hour | 0% | 0% | 100% | 100% | 100% | 100% |
| 96 hour | 0% | 0% | 100% | 100% | 100% | 100% |

| Test 5, 27 Feb-<br>3 Mar 1978 | Test Material, Nominal Conc. mg/l | | | | | |
|---|---|---|---|---|---|---|
| | Control | 0.0056 | 0.0100 | 0.0180 | 0.0320 | 0.0560 |
| 24 hour | 0% | 0% | 0% | 0% | 0% | 0% |
| 48 hour | 0% | 0% | 0% | 0% | 0% | 0% |
| 96 hour | 0% | 0% | 0% | 0% | 0% | 0% |

| Test 6<br>20-24 Mar 1978 | Test Material, Nominal Conc. mg/l | | | | | |
|---|---|---|---|---|---|---|
| | Control | 0.010 | 0.018 | 0.032 | 0.056 | 0.100 |
| 24 hour | 0% | 30% | 40% | 30% | 20% | 20% |
| 48 hour | 0% | 60% | 100% | 90% | 100% | 100% |
| 96 hour | 0% | 70% | 100% | 100% | 100% | 100% |

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| | |
|---|---|
| Client: | American Cyanamid Company |
| Date: | The test was conducted from 3 January through 7 January 1978. |
| Material: | Magnifloc 581C |
| UCES Proj. No. | 11506-47-21 |
| Summary: | The 96 hour $LC_{50}$ is 0.53 mg/l and the observed no effect level is 0.32 mg/l. |

| | |
|---|---|
| Species: | Bluegill sunfish, Lepomis macrochirus |
| Length: | 30 mm |
| Weight: | 0.31 grams |
| Biological Loading: | 0.21 g/l |
| Source: | Nebraska |
| 96 Hour $LC_{50}$: | 0.53 mg/l |
| 95% Conf. Limits: | 0.44 - 0.64 mg/l |
| No Effect Level: | 0.32 mg/l |
| Water Quality: | Soft |
| Temperature: | 22 ± 2°C |
| pH: | 7.67 |
| Hardness (as $CaCO_3$): | 42 mg/l |
| 96 Hr. $LC_{50}$ Ref. Toxicant p,p'-DDT: | 4.03 (3.59 - 4.52) µg/l |
| Notebook Reference: | No. 4627, pages 25, 26 |



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Table 57
Percent Mortalities and $LC_{50}$ Values - American Cyanamid Company
Magnifloc 581C - Bluegill Sunfish

Percent Mortality

| | Control | Test Material, Nominal Conc. mg/l | | | | |
|---|---|---|---|---|---|---|
| | | 0.10 | 0.18 | 0.32 | 0.56 | 1.00 |
| 24 hour | 0% | 0% | 0% | 0% | 0% | 90% |
| 48 hour | 0% | 0% | 0% | 0% | 50% | 100% |
| 96 hour | 0% | 0% | 0% | 0% | 60% | 100% |

$LC_{50}$ Values

| | | 24 Hour | 48 Hour | 96 Hour |
|---|---|---|---|---|
| $LC_{50}$, mg/l | | 0.75 | 0.56 | 0.53 |
| 95% Confidence Limits | Low | 0.64 | 0.47 | 0.44 |
| | High | 0.89 | 0.68 | 0.64 |

Observed 96 hour no effect level: 0.32 mg/l.

Table 58
Physical and Chemical Parameters - American Cyanamid Company
Magnifloc 581C - Bluegill Sunfish

Dilution Water

pH: 7.67 Total Hardness: 42 mg/l as $CaCO_3$
Average Temperature: 20.6°C Total Alkalinity: 31 mg/l as $CaCO_3$
Range: 20.4-21.0°C Conductivity: 135 µmhos/cm

Dissolved Oxygen, mg/l

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 0.10 | 0.32 | 1.00 |
| Initial | 9.2 | 9.0 | 9.0 | 9.0 |
| 48 hour | 7.7 | 7.0 | 7.5 | 8.6 |
| 96 hour | 7.1 | 6.7 | 6.6 | * |

pH

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 0.10 | 0.32 | 1.00 |
| Initial | 7.67 | 7.67 | 7.67 | 7.65 |
| 96 hour | 7.18 | 7.14 | 7.19 | * |

*Data not collected after 100% mortality.

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| | |
|---|---|
| Client: | American Cyanamid Company |
| Date: | The test was conducted from 3 January through 7 January 1978. |
| Material: | Magnifloc 581C |
| UCES Proj. No.: | 11506-47-22 |
| Summary: | The 96 hour $LC_{50}$ is 0.42 mg/l and the observed no effect level is 0.32 mg/l. |
| Species: | Rainbow trout, Salmo gairdneri |
| Length: | 52 mm |
| Weight: | 1.19 grams |
| Biological Loading: | 0.79 g/l |
| Source: | Washington |
| 96 Hour $LC_{50}$: | 0.42 mg/l |
| 95% Conf. Limits: | Not available due to lack of partial mortalities |
| No Effect Level: | 0.32 mg/l |
| Water Quality: | Soft |
| Temperature: | 12 ± 2°C |
| pH: | 7.66 |
| Hardness (as $CaCO_3$): | 42 mg/l |
| 96 Hr. $LC_{50}$ Ref. Toxicant p,p'-DDT: | 10.59 (8.31 - 13.50) µg/l |
| Notebook Reference: | No. 4627, pages 27, 28 |

Table 59
Percent Mortalities and $LC_{50}$ Values - American Cyanamid Company
Magnifloc 581C - Rainbow Trout

Percent Mortality

| | Control | Test Material, Nominal Conc. mg/l | | | | |
|---|---|---|---|---|---|---|
| | | 0.10 | 0.18 | 0.32 | 0.56 | 1.00 |
| 24 hour | 0% | 0% | 0% | 0% | 40% | 100% |
| 48 hour | 0% | 0% | 0% | 0% | 100% | 100% |
| 96 hour | 0% | 0% | 0% | 0% | 100% | 100% |

$LC_{50}$ Values

| | | 24 Hour | 48 Hour | 96 Hour |
|---|---|---|---|---|
| $LC_{50}$, mg/l | | 0.60 | 0.42 | 0.42 |
| 95% Confidence Limits | Low | 0.49 | N.A. | N.A. |
| | High | 0.72 | N.A. | N.A. |

Observed 96 hour no effect level: 0.32 mg/l.
N.A. = Not available due to lack of partial mortalities.

Table 60
Physical and Chemical Parameters - American Cyanamid Company
Magnifloc 581C - Rainbow Trout

Dilution Water

pH: 7.66 Total Hardness: 42 mg/l as $CaCO_3$
Average Temperature: 12.1°C Total Alkalinity: 31 mg/l as $CaCO_3$
Range: 12.0-12.4°C Conductivity: 135 µmhos/cm

Dissolved Oxygen, mg/l

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 0.10 | 0.32 | 1.00 |
| Initial | 9.5 | 9.3 | 9.3 | 9.0 |
| 48 hour | 7.2 | 7.1 | 7.2 | * |
| 96 hour | 6.9 | 7.9 | 7.0 | * |

pH

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 0.10 | 0.32 | 1.00 |
| Initial | 7.66 | 7.69 | 7.69 | 7.67 |
| 96 hour | 7.01 | 7.10 | 7.05 | * |

*Data not collected after 100% mortality.

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| | |
|---|---|
| Client: | American Cyanamid Company |
| Date: | The test was conducted from 22 February through 27 February 1978. |
| Material: | Magnifloc 585C |
| UCES Proj. No. | 11506-47-23 |
| Summary: | The 96 hour $LC_{50}$ is 1.28 mg/l and the observed no effect level is 0.32 mg/l. |
| Species: | Bluegill sunfish, Lepomis macrochirus |
| Length: | 37 mm |
| Weight: | 0.58 grams |
| Biological Loading: | 0.39 g/l |
| Source: | Nebraska |
| 96 Hour $LC_{50}$: | 1.28 mg/l |
| 95% Conf. Limits: | 1.14 - 1.43 mg/l |
| No Effect Level: | 0.32 mg/l |
| Water Quality: | Soft |
| Temperature: | 22.0 ± 2°C |
| pH: | 7.48 |
| Hardness (as $CaCO_3$): | 40 mg/l |
| 96 Hr. $LC_{50}$ Ref. Toxicant p,p'-DDT: | 4.03 (3.59 - 4.52) µg/l |
| Notebook Reference: | No. 4627, pages 77, 78 |



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**Table 61**
**Percent Mortalities and $LC_{50}$ Values - American Cyanamid Company**
**Magnifloc 585C - Bluegill Sunfish**

**Percent Mortality**

| | Control | Test Material, Nominal Conc. mg/l | | | | |
|---|---|---|---|---|---|---|
| | | 0.18 | 0.32 | 0.56 | 1.00 | 1.80 |
| 24 hour | 0% | 0% | 0% | 0% | 0% | 30% |
| [illegible] hour | 0% | 0% | 0% | 0% | 0% | 60% |
| 96 hour | 0% | 0% | 0% | 0% | 10% | 100% |

**$LC_{50}$ Values**

| | | 24 Hour | 48 Hour | 96 Hour |
|---|---|---|---|---|
| $LC_{50}$, mg/l | | >1.80 | 1.71 | 1.28 |
| 95% Confidence Limits | Low | N.A. | 1.41 | 1.14 |
| | High | N.A. | 2.06 | 1.43 |

Observed 96 hour no effect level: 0.32 mg/l.
N.A. = Not available.

**Table 62**
**Physical and Chemical Parameters - American Cyanamid Company**
**Magnifloc 585C - Bluegill Sunfish**

**Dilution Water**

pH: 7.48
Average Temperature: 22.0°C
Range: ±2°C

Total Hardness: 40 mg/l as $CaCO_3$
Total Alkalinity: 25 mg/l as $CaCO_3$
Conductivity: 160 µmhos/cm

**Dissolved Oxygen, mg/l**

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 0.18 | 0.56 | 1.80 |
| Initial | 9.5 | 9.2 | 9.0 | 9.0 |
| 48 hour | 6.6 | 6.8 | 7.4 | 8.0 |
| 96 hour | 6.6 | 6.6 | 6.2 | * |

**pH**

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 0.18 | 0.56 | 1.80 |
| Initial | 7.48 | 7.54 | 7.55 | 7.56 |
| 96 hour | 7.07 | 7.07 | 7.04 | * |

*Data not collected after 100% mortality.

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| | |
|---|---|
| **Client:** | American Cyanamid Company |
| **Dates:** | Three tests were performed for Magnifloc 585C:<br>Test 1: 21-25 Feb 1978 Test 2: 27 Feb-3 Mar 1978<br>Test 3: 20-24 Mar 1978 |
| **Material:** | Magnifloc 585C |
| **UCES Proj. No.:** | 11506-47-24 |
| **Summary:** | The 96 hour $LC_{50}$ for Magnifloc 585C to rainbow trout is not presented due to variability observed between the results of the three tests. All data for the tests is based upon nominal concentrations of the chemical in soft reconstituted water. |
| **Species:** | Rainbow trout, Salmo gairdneri |
| **Length:** | Test 1: 48 mm Test 2: 49 mm Test 3: 38 mm |
| **Weight:** | Test 1: 0.84 g Test 2: 0.96 g Test 3: 0.41 g |
| **Biological Loading:** | Test 1: 0.56 g/l Test 2: 0.64 g/l Test 3: 0.27 g/l |
| **Source:** | Washington |
| **96 Hour $LC_{50}$:** | See tables |
| **95% Conf. Limits:** | See tables |
| **No Effect Levels:** | Test 1: 0.18mg/l Test 2:<1.0mg/l Test 3:<0.18mg/l |
| **Water Quality:** | Soft |
| **Temperature:** | Test 1: 12.5±0.5°C Tests 2 and 3: 12.0±0.5°C |
| **pH:** | Test 1: 7.79 Test 2: 7.47 Test 3: 7.54 |
| **Hardness (as $CaCO_3$):** | Test 1: 46 mg/l Test 2: 44 mg/l Test 3: 44 mg/l |
| **96 Hr. $LC_{50}$ Ref. Toxicant p,p'-DDT:** | 10.59 (8.31 - 13.50) µg/l |
| **Notebook Reference:** | No. 4627, pages 79, 80 |

Table 63
Percent Mortalities and $LC_{50}$ Values - American Cyanamid Company
Magnifloc 585C - Rainbow Trout

Test 1
21-24 February 1978

Percent Mortality

| | Control | Test Material, Nominal Conc. mg/l | | | | |
|---|---|---|---|---|---|---|
| | | 0.10 | 0.18 | 0.32 | 0.56 | 1.00 |
| 24 hour | 0% | 0% | 0% | 0% | 0% | 0% |
| 48 hour | 0% | 0% | 0% | 0% | 0% | 0% |
| 96 hour | 0% | 0% | 0% | 0% | 0% | 0% |

$LC_{50}$ Values

The 96 hour $LC_{50}$ values for Test 1 are greater than 1.00 mg/l. The validity of this value, however, is questionable when test data for Tests 1, 2 and 3 are compared for Magnifloc 585C.

Observed 96 hour no effect level: 0.18 mg/l.

Table 64
Physical and Chemical Parameters - American Cyanamid Company
Magnifloc 585C - Rainbow Trout

Test 1
21-24 February 1978

Dilution Water

pH: 7.79
Average Temperature: 12.5°C
Range: ±0.5°C

Total Hardness: 46 mg/l as $CaCO_3$
Total Alkalinity: 35 mg/l as $CaCO_3$
Conductivity: 195 µmhos/cm

Dissolved Oxygen, mg/l

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 0.10 | 0.32 | 1.00 |
| Initial | 8.8 | 8.8 | 8.8 | 8.8 |
| 48 hour | 8.4 | 8.2 | 8.2 | 7.9 |
| 96 hour | 7.9 | 9.0 | 8.7 | 8.3 |

pH

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 0.10 | 0.32 | 1.00 |
| Initial | 7.79 | 7.79 | 7.77 | 7.77 |
| 96 hour | 7.23 | 7.33 | 7.31 | 7.31 |

Table 65
Percent Mortalities and $LC_{50}$ Values - American Cyanamid Company
Magnifloc 585C - Rainbow Trout

Test 2
27 Feb-3 Mar 1978

Percent Mortality

| | Control | Test Material, Nominal Conc. mg/l | | | | |
|---|---|---|---|---|---|---|
| | | 1.0 | 1.8 | 3.2 | 5.6 | 10.0 |
| 24 hour | 0% | 100% | 100% | 100% | 100% | 100% |
| 48 hour | 0% | 100% | 100% | 100% | 100% | 100% |
| 96 hour | 0% | 100% | 100% | 100% | 100% | 100% |

$LC_{50}$ Values

The 96 hour $LC_{50}$ values for Test 2 are less than 1.0 mg/l. The validity of this value, however, is questionable when test data for Tests 1, 2 and 3 are compared for Magnifloc 585C.

Observed 96 hour no effect level: <1.0 mg/l.

Table 66
Physical and Chemical Parameters - American Cyanamid Company
Magnifloc 585C - Rainbow Trout

Test 2
27 Feb-3 Mar 1978

Dilution Water

pH: 7.47
Average Temperature: 12.0°C
Range: ±0.5°C

Total Hardness: 44 mg/l as $CaCO_3$
Total Alkalinity: 31 mg/l as $CaCO_3$
Conductivity: 175 µmhos/cm

Dissolved Oxygen, mg/l

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 1.0 | 3.2 | 10.0 |
| Initial | 9.5 | 9.2 | 9.4 | 9.2 |
| 48 hour | 8.8 | * | * | * |
| 96 hour | 7.7 | * | * | * |

pH

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 1.0 | 3.2 | 10.0 |
| Initial | 7.47 | 7.46 | 7.45 | 7.45 |
| 96 hour | 7.18 | * | * | * |

*Data not collected after 100% mortality.

0 0 6 4

Table 67
Percent Mortalities and $LC_{50}$ Values - American Cyanamid Company
Magnifloc 585C - Rainbow Trout

Test 3
20-24 March 1978

Percent Mortality

| | Control | Test Material, Nominal Conc. mg/l | | | | |
|---|---|---|---|---|---|---|
| | | 0.18 | 0.32 | 0.56 | 1.00 | 1.80 |
| 24 hour | 0% | 0% | 0% | 0% | 60% | 90% |
| 48 hour | 0% | 30% | 50% | 80% | 100% | 100% |
| 96 hour | 0% | 30% | 80% | 100% | 100% | 100% |

$LC_{50}$ Values

$LC_{50}$ values for this compound, although calculable, are not totally reliable. This statement is made based upon the variability exhibited in the three Magnifloc 585C rainbow trout tests performed.

Observed 96 hour no effect level: <0.18 mg/l.

Table 68
Physical and Chemical Parameters - American Cyanamid Company
Magnifloc 585C - Rainbow Trout

Test 3
20-24 March 1978

Dilution Water

pH: 7.54
Average Temperature: 12.0°C
Range: ±0.5°C

Total Hardness: 44 mg/l as $CaCO_3$
Total Alkalinity: 30 mg/l as $CaCO_3$
Conductivity: 175 µmhos/cm

Dissolved Oxygen, mg/l

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 0.18 | 0.56 | 1.80 |
| Initial | 9.0 | 9.0 | 9.2 | 9.2 |
| 48 hour | 8.2 | 8.2 | 8.7 | 9.0 |
| 96 hour | 8.2 | 8.2 | * | * |

pH

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 0.18 | 0.56 | 1.80 |
| Initial | 7.54 | 7.54 | 7.49 | 7.45 |
| 96 hour | 7.38 | 7.39 | * | * |

*Data not collected after 100% mortality.

**Table 69**
**Comparative Mortality Values - American Cyanamid Company**
**Magnifloc 585C - Rainbow Trout**
**Percent Mortalities**

**Test 1, 21-25 February 1978**

| | Control | Test Material, Nominal Conc. mg/l 0.10 | 0.18 | 0.32 | 0.56 | 1.00 |
|---|---|---|---|---|---|---|
| 24 hour | 0% | 0% | 0% | 0% | 0% | 0% |
| 48 hour | 0% | 0% | 0% | 0% | 0% | 0% |
| 96 hour | 0% | 0% | 0% | 0% | 0% | 0% |

**Test 2, 27 February-3 March 1978**

| | Control | Test Material, Nominal Conc. mg/l 1.0 | 1.8 | 3.2 | 5.6 | 10.0 |
|---|---|---|---|---|---|---|
| 24 hour | 0% | 100% | 100% | 100% | 100% | 100% |
| 48 hour | 0% | 100% | 100% | 100% | 100% | 100% |
| 96 hour | 0% | 100% | 100% | 100% | 100% | 100% |

**Test 3, 20-24 March 1978**

| | Control | Test Material, Nominal Conc. mg/l 0.18 | 0.32 | 0.56 | 1.00 | 1.80 |
|---|---|---|---|---|---|---|
| 24 hour | 0% | 0% | 0% | 0% | 60% | 90% |
| 48 hour | 0% | 30% | 50% | 80% | 100% | 100% |
| 96 hour | 0% | 30% | 80% | 100% | 100% | 100% |

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| | |
|---|---|
| Client: | American Cyanamid Company |
| Date: | The test was conducted from 27 December through 31 December 1977. |
| Material: | Magnifloc 591C |
| UCES Proj. No. | 11506-47-25 |
| Summary: | The 96 hour $LC_{50}$ is 0.9 mg/l and the observed no effect level is 0.56 mg/l. |

| | |
|---|---|
| Species: | Bluegill sunfish, Lepomis macrochirus |
| Length: | 31 mm |
| Weight: | 0.30 grams |
| Biological Loading: | 0.20 g/l |
| Source: | Nebraska |
| 96 Hour $LC_{50}$: | 0.9 mg/l |
| 95% Conf. Limits: | 0.7 - 1.1 mg/l |
| No Effect Level: | 0.56 mg/l |
| Water Quality: | Soft |
| Temperature: | 22 ± 2°C |
| pH: | 7.37 |
| Hardness (as $CaCO_3$): | 38 mg/l |
| 96 Hr. $LC_{50}$ Ref. Toxicant p,p'-DDT: | 4.03 (3.59 - 4.52) µg/l |
| Notebook Reference: | No. 4627, pages 17, 18 |

Table 70
Percent Mortalities and $LC_{50}$ Values - American Cyanamid Company
Magnifloc 591C - Bluegill Sunfish

Percent Mortality

| | Control | Test Material, Nominal Conc. mg/l | | | | |
|---|---|---|---|---|---|---|
| | | 0.56 | 1.00 | 1.80 | 3.20 | 5.60 |
| 24 hour | 0% | 0% | 40% | 90% | 90% | 100% |
| 48 hour | 0% | 0% | 70% | 90% | 100% | 100% |
| 96 hour | 0% | 0% | 80% | 90% | 100% | 100% |

$LC_{50}$ Values

| | | 24 Hour | 48 Hour | 96 Hour |
|---|---|---|---|---|
| $LC_{50}$, mg/l | | 1.2 | 0.9 | 0.9 |
| 95% Confidence Limits | Low | 0.9 | 0.8 | 0.7 |
| | High | 1.5 | 1.2 | 1.1 |

Observed 96 hour no effect level: 0.56 mg/l.

Table 71
Physical and Chemical Parameters - American Cyanamid Company
Magnifloc 591C - Bluegill Sunfish

Dilution Water

pH: 7.37 Total Hardness: 38 mg/l as $CaCO_3$
Average Temperature: 21.3°C Total Alkalinity: 27 mg/l as $CaCO_3$
Range: 21.0-22.0°C Conductivity: 129 umhos/cm

Dissolved Oxygen, mg/l

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 0.56 | 1.80 | 5.60 |
| Initial | 9.7 | 9.4 | 9.6 | 9.5 |
| 48 hour | 7.7 | 8.3 | 9.1 | * |
| 96 hour | 7.4 | 7.9 | 8.3 | * |

pH

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 0.56 | 1.80 | 5.60 |
| Initial | 7.37 | 7.38 | 7.38 | 7.38 |
| 96 hour | 7.19 | 7.26 | 7.51 | * |

*Data not collected after 100% mortality.

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| | |
|---|---|
| Client: | American Cyanamid Company |
| Date: | The test was conducted from 3 January through 7 January 1978. |
| Material: | Magnifloc 591C |
| UCES Proj. No.: | 11506-47-26 |
| Summary: | The 96 hour $LC_{50}$ is 0.60 mg/l and the observed no effect level is 0.18 mg/l. |

| | |
|---|---|
| Species: | Rainbow trout, Salmo gairdneri |
| Length: | 50 mm |
| Weight: | 1.02 grams |
| Biological Loading: | 0.68 mg/l |
| Source: | Washington |
| 96 Hour $LC_{50}$: | 0.60 mg/l |
| 95% Conf. Limits: | 0.49 - 0.72 mg/l |
| No Effect Level: | 0.18 mg/l |
| Water Quality: | Soft |
| Temperature: | 12 ± 2°C |
| pH: | 7.66 |
| Hardness (as $CaCO_3$): | 42 mg/l |
| 96 Hr. $LC_{50}$ Ref. Toxicant p,p'-DDT: | 10.59 (8.31 - 13.50) µg/l |
| Notebook Reference: | No. 4627, pages 29, 30 |



0 0 6 9

Table 72
Percent Mortalities and $LC_{50}$ Values - American Cyanamid Company
Magnifloc 591C - Rainbow Trout

Percent Mortality

| | Control | Test Material, Nominal Conc. mg/l | | | | |
|---|---|---|---|---|---|---|
| | | 0.10 | 0.18 | 0.32 | 0.56 | 1.00 |
| 24 hour | 0% | 0% | 0% | 0% | 20% | 100% |
| 48 hour | 0% | 0% | 0% | 0% | 40% | 100% |
| 96 hour | 0% | 0% | 0% | 0% | 40% | 100% |

$LC_{50}$ Values

| | | 24 Hour | 48 Hour | 96 Hour |
|---|---|---|---|---|
| $LC_{50}$, mg/l | | 0.67 | 0.60 | 0.60 |
| 95% Confidence Limits | Low | 0.57 | 0.49 | 0.49 |
| | High | 0.78 | 0.72 | 0.72 |

Observed 96 hour no effect level: 0.18 mg/l.

Table 73
Physical and Chemical Parameters - American Cyanamid Company
Magnifloc 591C - Rainbow Trout

Dilution Water

pH: 7.66 Total Hardness: 42 mg/l as $CaCO_3$
Average Temperature: 12.1°C Total Alkalinity: 31 mg/l as $CaCO_3$
Range: 12.0-12.4°C Conductivity: 135 µmhos/cm

Dissolved Oxygen, mg/l

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 0.10 | 0.32 | 1.00 |
| Initial | 9.4 | 9.2 | 9.2 | 9.1 |
| 48 hour | 7.3 | 6.4 | 6.7 | * |
| 96 hour | 6.7 | 6.6 | 6.7 | * |

pH

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 0.10 | 0.32 | 1.00 |
| Initial | 7.66 | 7.66 | 7.66 | 7.66 |
| 96 hour | 7.01 | 7.02 | 7.05 | * |

*Data not collected after 100% mortality.

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| | |
|---|---|
| Client: | American Cyanamid Company |
| Date: | The test was conducted from 11 January through 15 January 1978. |
| Material: | Magnifloc 1839A |
| UCES Proj. No. | 11506-47-11 |
| Summary: | The 96 hour $LC_{50}$ is 89.5 mg/l and the observed no effect level is 18.0 mg/l. |

| | |
|---|---|
| Species: | Bluegill sunfish, Lepomis macrochirus |
| Length: | 31 mm |
| Weight: | 0.35 grams |
| Biological Loading: | 0.23 g/l |
| Source: | Nebraska |
| 96 Hour $LC_{50}$: | 89.5 mg/l |
| 95% Conf. Limits: | 75.0 - 106.7 mg/l |
| No Effect Level: | 18.0 mg/l |
| Water Quality: | Soft |
| Temperature: | 22 ± 2°C |
| pH: | 7.29 |
| Hardness (as $CaCO_3$): | 42 mg/l |
| 96 Hr. $LC_{50}$ Ref. Toxicant p,p'-DDT: | 4.03 (3.59 - 4.52) µg/l |
| Notebook Reference: | No. 4627, pages 31, 32 |

Table 74
Percent Mortalities and $LC_{50}$ Values - American Cyanamid Company
Magnifloc 1839A - Bluegill Sunfish

Percent Mortality

| | Control | Test Material, Nominal Conc. mg/l | | | | |
|---|---|---|---|---|---|---|
| | | 10.0 | 18.0 | 32.0 | 56.0 | 100.0 |
| 24 hour | 0% | 0% | 0% | 0% | 0% | 10% |
| 48 hour | 0% | 0% | 0% | 0% | 0% | 10% |
| 96 hour | 0% | 0% | 0% | 0% | 0% | 70% |

$LC_{50}$ Values

| | | 24 Hour | 48 Hour | 96 Hour |
|---|---|---|---|---|
| $LC_{50}$, mg/l | | >100.0 | >100.0 | 89.5 |
| 95% Confidence Limits | Low | N.A. | N.A. | 75.0 |
| | High | N.A. | N.A. | 106.7 |

Observed 96 hour no effect level: 18.0 mg/l.
N.A. = Not available.

Table 75
Physical and Chemical Parameters - American Cyanamid Company
Magnifloc 1839A - Bluegill Sunfish

Dilution Water

pH: 7.29 Total Hardness: 42 mg/l as $CaCO_3$
Average Temperature: 20.8°C Total Alkalinity: 30 mg/l as $CaCO_3$
Range: 20.5-21.0°C Conductivity: 149 µmhos/cm

Dissolved Oxygen, mg/l

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 10.0 | 32.0 | 100.0 |
| Initial | 8.8 | 8.7 | 9.1 | 9.0 |
| 48 hour | 6.8 | 6.5 | 6.1 | 5.3 |
| 96 hour | 6.8 | 6.0 | 4.2 | 2.2 |

pH

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 10.0 | 32.0 | 100.0 |
| Initial | 7.29 | 7.27 | 7.28 | 7.28 |
| 96 hour | 7.18 | 7.10 | 6.95 | 6.77 |

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| | |
|---|---|
| Client: | American Cyanamid Company |
| Date: | The test was conducted from 11 January through 15 January 1978. |
| Material: | Magnifloc 1839A |
| UCES Proj. No.: | 11506-47-12 |
| Summary: | The 96 hour $LC_{50}$ is 75.2 mg/l and the observed no effect level is 10.0 mg/l. |
| Species: | Rainbow trout, Salmo gairdneri |
| Length: | 53 mm |
| Weight: | 1.18 grams |
| Biological Loading: | 0.79 g/l |
| Source: | Washington |
| 96 Hour $LC_{50}$: | 75.2 mg/l |
| 95% Conf. Limits: | Not available due to lack of partial mortalities |
| No Effect Level: | 10.0 mg/l |
| Water Quality: | Soft |
| Temperature: | 12.0 ± 2°C |
| pH: | 7.49 |
| Hardness (as $CaCO_3$): | 44 mg/l |
| 96 Hr. $LC_{50}$ Ref. Toxicant p,p'-DDT: | 10.59 (8.31 - 13.50) µg/l |
| Notebook Reference: | No. 4627, pages 33, 34 |

Table 76
Percent Mortalities and $LC_{50}$ Values - American Cyanamid Company
Magnifloc 1839A - Rainbow Trout

Percent Mortality

| | Control | Test Material, Nominal Conc. mg/l | | | | |
|---|---|---|---|---|---|---|
| | | 10.0 | 18.0 | 32.0 | 56.0 | 100.0 |
| 24 hour | 0% | 0% | 0% | 0% | 0% | 80% |
| 48 hour | 0% | 0% | 0% | 0% | 0% | 100% |
| 96 hour | 0% | 0% | 0% | 0% | 0% | 100% |

$LC_{50}$ Values

| | | 24 Hour | 48 Hour | 96 Hour |
|---|---|---|---|---|
| $LC_{50}$, mg/l | | 84.4 | 75.2 | 75.2 |
| 95% Confidence Limits | Low | N.A. | N.A. | N.A. |
| | High | N.A. | N.A. | N.A. |

Observed 96 hour no effect level: 10.0 mg/l.
N.A. = Not available due to lack of partial mortalities.

Table 77
Physical and Chemical Parameters - American Cyanamid Company
Magnifloc 1839A - Rainbow Trout

Dilution Water

pH: 7.49 Total Hardness: 44 mg/l as $CaCO_3$
Average Temperature: 12.3°C Total Alkalinity: 35 mg/l as $CaCO_3$
Range: 12.0-12.5°C Conductivity: 175 µmhos/cm

Dissolved Oxygen, mg/l

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 10.0 | 32.0 | 100.0 |
| Initial | 9.2 | 8.9 | 9.2 | 8.9 |
| 48 hour | 6.9 | 5.3 | 5.5 | 6.6 |
| 96 hour | 7.5 | 4.7 | 5.2 | * |

pH

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 10.0 | 32.0 | 100.0 |
| Initial | 7.49 | 7.47 | 7.41 | 7.22 |
| 96 hour | 6.97 | 6.86 | 6.90 | * |

*Data not collected after 100% mortality.

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| | |
|---|---|
| Client: | American Cyanamid Company |
| Date: | The test was conducted from 9 January through 13 January 1978. |
| Material: | Magnifloc 1820A |
| UCES Proj. No. | 11506-47-7 |
| Summary: | The 96 hour $LC_{50}$ is 84.4 mg/l and the observed no effect level is 18.0 mg/l. |

| | |
|---|---|
| Species: | Bluegill sunfish, Lepomis macrochirus |
| Length: | 32 mm |
| Weight: | 0.38 grams |
| Biological Loading: | 0.25 g/l |
| Source: | Nebraska |
| 96 Hour $LC_{50}$: | 84.4 mg/l |
| 95% Conf. Limits: | 68.4 - 104.2 mg/l |
| No Effect Level: | 18.0 mg/l |
| Water Quality: | Soft |
| Temperature: | 22 ± 2°C |
| pH: | 7.30 |
| Hardness (as $CaCO_3$): | 44 mg/l |
| 96 Hr. $LC_{50}$ Ref. Toxicant p,p'-DDT: | 4.03 (3.59 - 4.52) µg/l |
| Notebook Reference: | No. 4627, pages 39, 40 |

Table 78
Percent Mortalities and $LC_{50}$ Values - American Cyanamid Company
Magnifloc 1820A - Bluegill Sunfish

Percent Mortality

| | Control | Test Material, Nominal Conc. mg/l | | | | |
|---|---|---|---|---|---|---|
| | | 10.0 | 18.0 | 32.0 | 56.0 | 100.0 |
| 24 hour | 0% | 0% | 0% | 0% | 0% | 60% |
| 48 hour | 0% | 0% | 0% | 0% | 10% | 60% |
| 96 hour | 0% | 0% | 0% | 0% | 10% | 70% |

$LC_{50}$ Values

| | | 24 Hour | 48 Hour | 96 Hour |
|---|---|---|---|---|
| $LC_{50}$, mg/l | | 94.8 | 89.5 | 84.4 |
| 95% Confidence Limits | Low | 78.5 | 71.7 | 68.4 |
| | High | 114.4 | 111.6 | 104.2 |

Observed 96 hour no effect level: 18.0 mg/l.

Table 79
Physical and Chemical Parameters - American Cyanamid Company
Magnifloc 1820A - Bluegill Sunfish

Dilution Water

pH: 7.30
Average Temperature: 21°C
Range: ±2°C

Total Hardness: 44 mg/l as $CaCO_3$
Total Alkalinity: 35 mg/l as $CaCO_3$
Conductivity: 175 µmhos/cm

Dissolved Oxygen, mg/l

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 10.0 | 32.0 | 100.0 |
| Initial | 8.9 | 8.7 | 8.6 | 8.5 |
| 48 hour | 7.1 | 6.0 | 6.1 | 5.7 |
| 96 hour | 6.7 | 6.0 | 5.2 | 2.9 |

pH

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 10.0 | 32.0 | 100.0 |
| Initial | 7.30 | 7.30 | 7.24 | 7.09 |
| 96 hour | 7.20 | 7.08 | 7.02 | 6.83 |

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| | |
|---|---|
| Client: | American Cyanamid Company |
| Date: | The test was conducted from 11 January through 15 January 1978. |
| Material: | Magnifloc 1820A |
| UCES Proj. No.: | 11506-47-8 |
| Summary: | The 96 hour $LC_{50}$ is 53.2 mg/l and the observed no effect level is 18.0 mg/l. |
| Species: | Rainbow trout, Salmo gairdneri |
| Length: | 54 mm |
| Weight: | 1.3 grams |
| Biological Loading: | 0.87 g/l |
| Source: | Washington |
| 96 Hour $LC_{50}$: | 53.2 mg/l |
| 95% Conf. Limits: | 44.1 - 64.3 mg/l |
| No Effect Level: | 18.0 mg/l |
| Water Quality: | Soft |
| Temperature: | 12 ± 2°C |
| pH: | 7.40 |
| Hardness (as $CaCO_3$): | 42 mg/l |
| 96 Hr. $LC_{50}$ Ref. Toxicant p,p'-DDT: | 10.59 (8.31 - 13.50) µg/l |
| Notebook Reference: | No. 4627, pages 41, 42 |

Table 80
Percent Mortalities and $LC_{50}$ Values - American Cyanamid Company
Magnifloc 1820A - Rainbow Trout

Percent Mortality

| | Control | Test Material, Nominal Conc. mg/l | | | | |
|---|---|---|---|---|---|---|
| | | 10.0 | 18.0 | 32.0 | 56.0 | 100.0 |
| 24 hour | 0% | 0% | 0% | 0% | 0% | 100% |
| 48 hour | 0% | 0% | 0% | 0% | 50% | 100% |
| 96 hour | 0% | 0% | 0% | 0% | 60% | 100% |

$LC_{50}$ Values

| | | 24 Hour | 48 Hour | 96 Hour |
|---|---|---|---|---|
| $LC_{50}$, mg/l | | 75.2 | 56.4 | 53.2 |
| 95% Confidence Limits | Low | N.A. | 46.5 | 44.1 |
| | High | N.A. | 68.4 | 64.3 |

Observed 96 hour no effect level: 18.0 mg/l.
N.A. = Not available.

Table 81
Physical and Chemical Parameters - American Cyanamid Company
Magnifloc 1820A - Rainbow Trout

Dilution Water

pH: 7.40 Total Hardness: 42 mg/l as $CaCO_3$
Average Temperature: 12.2°C Total Alkalinity: 30 mg/l as $CaCO_3$
Range: 12.0-12.5°C Conductivity: 149 µmhos/cm

Dissolved Oxygen, mg/l

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 10.0 | 32.0 | 100.0 |
| Initial | 9.4 | 9.2 | 9.2 | 8.7 |
| 48 hour | 6.7 | 6.4 | 5.2 | * |
| 96 hour | 5.7 | 6.5 | 5.1 | * |

pH

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 10.0 | 32.0 | 100.0 |
| Initial | 7.40 | 7.48 | 7.41 | 7.20 |
| 96 hour | 6.90 | 6.90 | 6.88 | * |

*Data not collected after 100% mortality.

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| | |
|---|---|
| Client: | American Cyanamid Company |
| Date: | The test was conducted from 16 January through 20 January 1978. |
| Material: | Magnifloc 1906N |
| UCES Proj. No. | 11506-47-9 |
| Summary: | The 96 hour $LC_{50}$ is greater than 100.0 mg/l and the observed no effect level is 18.0 mg/l. |

| | |
|---|---|
| Species: | Bluegill sunfish, Lepomis macrochirus |
| Length: | 37 mm |
| Weight: | 0.6 grams |
| Biological Loading: | 0.40 g/l. |
| Source: | Nebraska |
| 96 Hour $LC_{50}$: | >100.0 mg/l |
| 95% Conf. Limits: | Not available |
| No Effect Level: | 18.0 mg/l |
| Water Quality: | Soft |
| Temperature: | 22.0 ± 1°C |
| pH: | 7.34 |
| Hardness (as $CaCO_3$): | 46 mg/l |
| 96 Hr. $LC_{50}$ Ref. Toxicant p,p'-DDT: | 4.03 (3.59 - 4.52) µg/l |
| Notebook Reference: | No. 4627, pages 47, 48 |



0 0 7 9

Table 82
Percent Mortalities and $LC_{50}$ Values - American Cyanamid Company
Magnifloc 1906N - Bluegill Sunfish

Percent Mortality

| | Control | Test Material, Nominal Conc. mg/l | | | | |
|---|---|---|---|---|---|---|
| | | 10.0 | 18.0 | 32.0 | 56.0 | 100.0 |
| 24 hour | 0% | 0% | 0% | 0% | 0% | 0% |
| 48 hour | 0% | 0% | 0% | 0% | 0% | 0% |
| 96 hour | 0% | 0% | 0% | 0% | 0% | 0% |

$LC_{50}$ Values

| | | 24 Hour | 48 Hour | 96 Hour |
|---|---|---|---|---|
| $LC_{50}$, mg/l | | >100.0 | >100.0 | >100.0 |
| 95% Confidence Limits | Low | N.A. | N.A. | N.A. |
| | High | N.A. | N.A. | N.A. |

Observed 96 hour no effect level: 18.0 mg/l.
N.A. = Not available.

Table 83
Physical and Chemical Parameters - American Cyanamid Company
Magnifloc 1906N - Bluegill Sunfish

Dilution Water

pH: 7.34 Total Hardness: 46 mg/l as $CaCO_3$
Average Temperature: 21.3°C Total Alkalinity: 30 mg/l as $CaCO_3$
Range: 21.0-22.0°C Conductivity: 158 µmhos/cm

Dissolved Oxygen, mg/l

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 10.0 | 32.0 | 100.0 |
| Initial | 9.0 | 9.0 | 9.1 | 9.1 |
| 48 hour | 5.2 | 3.8 | 5.1 | 5.1 |
| 96 hour | 5.3 | 3.7 | 3.2 | 2.8 |

pH

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 10.0 | 32.0 | 100.0 |
| Initial | 7.34 | 7.32 | 7.33 | 7.29 |
| 96 hour | 7.04 | 6.91 | 6.88 | 6.86 |

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| | |
|---|---|
| Client: | American Cyanamid Company |
| Date: | The test was conducted from 16 January through 20 January 1978. |
| Material: | Magnifloc 1906N |
| UCES Proj. No.: | 11506-47-10 |
| Summary: | The 96 hour $LC_{50}$ is greater than 100.0 mg/l and the no effect level is less than 10.0 mg/l. |
| Species: | Rainbow trout, Salmo gairdneri |
| Length: | 36 mm |
| Weight: | 0.29 grams |
| Biological Loading: | 0.19 g/l |
| Source: | Washington |
| 96 Hour $LC_{50}$: | >100.0 mg/l |
| 95% Conf. Limits: | Not available |
| No Effect Level: | <10.0 mg/l |
| Water Quality: | Soft |
| Temperature: | 12 ± 1°C |
| pH: | 7.45 |
| Hardness (as $CaCO_3$): | 42 mg/l |
| 96 Hr. $LC_{50}$ Ref. Toxicant p,p'-DDT: | 10.59 (8.31 - 13.50) µg/l |
| Notebook Reference: | No. 4627, pages 45, 46 |

Table 84
Percent Mortalities and $LC_{50}$ Values - American Cyanamid Company
Magnifloc 1906N - Rainbow Trout

Percent Mortality

| | Control | Test Material, Nominal Conc. mg/l | | | | |
|---|---|---|---|---|---|---|
| | | 10.0 | 18.0 | 32.0 | 56.0 | 100.0 |
| 24 hour | 0% | 0% | 0% | 0% | 0% | 0% |
| 48 hour | 0% | 0% | 0% | 0% | 0% | 10% |
| 96 hour | 0% | 0% | 0% | 0% | 0% | 20% |

$LC_{50}$ Values

| | | 24 Hour | 48 Hour | 96 Hour |
|---|---|---|---|---|
| $LC_{50}$, mg/l | | >100.0 | >100.0 | >100.0 |
| 95% Confidence Limits | Low | N.A. | N.A. | N.A. |
| | High | N.A. | N.A. | N.A. |

Observed 96 hour no effect level: <10.0 mg/l.
N.A. = Not available.

Table 85
Physical and Chemical Parameters - American Cyanamid Company
Magnifloc 1906N - Rainbow Trout

Dilution Water

pH: 7.45 Total Hardness: 42 mg/l as $CaCO_3$
Average Temperature: 12.2°C Total Alkalinity: 30 mg/l as $CaCO_3$
Range: 12.0-12.3°C Conductivity: 149 µmhos/cm

Dissolved Oxygen, mg/l

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 10.0 | 32.0 | 100.0 |
| Initial | 9.2 | 9.2 | 9.3 | 9.3 |
| 48 hour | 8.9 | 8.5 | 8.6 | 8.4 |
| 96 hour | 8.6 | 8.4 | 8.0 | 6.0 |

pH

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 10.0 | 32.0 | 100.0 |
| Initial | 7.45 | 7.47 | 7.44 | 7.44 |
| 96 hour | 7.25 | 7.17 | 7.16 | 7.00 |

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| | |
|---|---|
| Client: | American Cyanamid Company |
| Date: | The test was conducted from 13 December through 17 December 1977. |
| Material: | Magnifloc 1561C |
| UCES Proj. No. | 11506-47-3 |
| Summary: | The 96 hour $LC_{50}$ is 17.0 mg/l and the observed no effect level is 3.2 mg/l. |

| | |
|---|---|
| Species: | Bluegill sunfish, Lepomis macrochirus |
| Length: | 25.2 mm |
| Weight: | 0.15 grams |
| Biological Loading: | 0.1 g/l |
| Source: | Nebraska |
| 96 Hour $LC_{50}$: | 17.0 mg/l |
| 95% Conf. Limits: | 13.1 - 22.1 mg/l |
| No Effect Level: | 3.2 mg/l |
| Water Quality: | Soft |
| Temperature: | 22 ± 2°C |
| pH: | 7.57 |
| Hardness (as $CaCO_3$): | 44 mg/l |
| 96 Hr. $LC_{50}$ Ref. Toxicant p,p'-DDT: | 4.03 (3.59 - 4.52) µg/l |
| Notebook Reference: | No. 4627, pages 13, 14 |

Table 86
Percent Mortalities and $LC_{50}$ Values - American Cyanamid Company
Magnifloc 1561C - Bluegill Sunfish

Percent Mortality

| | Control | Test Material, Nominal Conc. mg/l | | | | |
|---|---|---|---|---|---|---|
| | | 3.2 | 5.6 | 10.0 | 18.0 | 32.0 |
| 24 hour | 0% | 0% | 0% | 10% | 20% | 80% |
| 48 hour | 0% | 0% | 0% | 20% | 20% | 90% |
| 96 hour | 0% | 0% | 10% | 20% | 30% | 100% |

$LC_{50}$ Values

| | | 24 Hour | 48 Hour | 96 Hour |
|---|---|---|---|---|
| $LC_{50}$, mg/l | | 22.7 | 20.3 | 17.0 |
| 95% Confidence Limits | Low | 17.8 | 15.8 | 13.1 |
| | High | 29.1 | 25.9 | 22.1 |

Observed 96 hour no effect level: 3.2 mg/l.

Table 87
Physical and Chemical Parameters - American Cyanamid Company
Magnifloc 1561C - Bluegill Sunfish

Dilution Water

pH: 7.57 Total Hardness: 44 mg/l as $CaCO_3$
Average Temperature: 20.6°C Total Alkalinity: 36 mg/l as $CaCO_3$
Range: 20.5-20.9°C Conductivity: 140 µmhos/cm

Dissolved Oxygen, mg/l

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 3.2 | 10.0 | 32.0 |
| Initial | 9.8 | 9.7 | 9.6 | 9.7 |
| 48 hour | 8.8 | 8.7 | 8.9 | 8.9 |
| 96 hour | 8.4 | 8.5 | 8.4 | 8.2 |

pH

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 3.2 | 10.0 | 32.0 |
| Initial | 7.57 | 7.56 | 7.58 | 7.56 |
| 96 hour | 7.42 | 7.37 | 7.34 | 7.34 |

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| | |
|---|---|
| Client: | American Cyanamid Company |
| Date: | The test was conducted from 27 December through 31 December 1977. |
| Material: | Magnifloc 1561C |
| UCES Proj. No.: | 11506-47-4 |
| Summary: | The 9- hour $LC_{50}$ is 2.7 mg/l and the observed no effect level is less than 1.8 mg/l. |
| Species: | Rainbow trout, Salmo gairdneri |
| Length: | 50 mm |
| Weight: | 1.10 grams |
| Biological Loading: | 0.73 g/l |
| Source: | Washington |
| 96 Hour $LC_{50}$: | 2.7 mg/l |
| 95% Conf. Limits: | 2.2 - 3.3 mg/l |
| No Effect Level: | <1.8 mg/l |
| Water Quality: | Soft |
| Temperature: | 12 ± 2°C |
| pH: | 7.52 |
| Hardness (as $CaCO_3$): | 34 mg/l |
| 96 Hr. $LC_{50}$ Ref. Toxicant p,p'-DDT: | 10.59 (8.31 - 13.50) µg/l |
| Notebook Reference: | No. 4627, pages 15, 16 |

Table 88
Percent Mortalities and $LC_{50}$ Values - American Cyanamid Company
Magnifloc 1561C - Rainbow Trout

Percent Mortality

| | Control | Test Material, Nominal Conc. mg/l | | | | |
|---|---|---|---|---|---|---|
| | | 1.8 | 3.2 | 5.6 | 10.0 | 18.0 |
| 24 hour | 0% | 10% | 10% | 80% | 80% | 100% |
| 48 hour | 0% | 10% | 20% | 100% | 100% | 100% |
| 96 hour | 0% | 10% | 70% | 100% | 100% | 100% |

$LC_{50}$ Values

| | | 24 Hour | 48 Hour | 96 Hour |
|---|---|---|---|---|
| $LC_{50}$, mg/l | | 4.8 | 3.6 | 2.7 |
| 95% Confidence Limits | Low | 3.7 | 3.0 | 2.2 |
| | High | 6.3 | 4.4 | 3.3 |

Observed 96 hour no effect level: <1.8 mg/l.

Table 89
Physical and Chemical Parameters - American Cyanamid Company
Magnifloc 1561C - Rainbow Trout

Dilution Water

pH: 7.52 Total Hardness: 34 mg/l as $CaCO_3$
Average Temperature: 12.2°C Total Alkalinity: 35 mg/l as $CaCO_3$
Range: 11.8-12.5°C Conductivity: 160 µmhos/cm

Dissolved Oxygen, mg/l

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 1.8 | 5.6 | 18.0 |
| Initial | 9.9 | 9.8 | 9.9 | 10.0 |
| 48 hour | 8.2 | 8.1 | 9.3 | * |
| 96 hour | 8.0 | 7.4 | * | * |

pH

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 1.8 | 5.6 | 18.0 |
| Initial | 7.52 | 7.53 | 7.54 | 7.54 |
| 96 hour | 7.10 | 7.13 | * | * |

*Data not collected after 100% mortality.

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| | |
|---|---|
| Client: | American Cyanamid Company |
| Date: | The test was conducted from 7 December through 11 December 1977. |
| Material: | Magnifloc 1563C |
| UCES Proj. No. | 11506-47-5 |
| Summary: | The 96 hour $LC_{50}$ is 4.5 mg/l and the observed no effect level is 3.2 mg/l. |
| Species: | Bluegill sunfish, Lepomis macrochirus |
| Length: | 40 mm |
| Weight: | 0.69 grams |
| Biological Loading: | 0.46 g/l |
| Source: | Nebraska |
| 96 Hour $LC_{50}$: | 4.5 mg/l |
| 95% Conf. Limits: | 4.0 - 5.0 mg/l |
| No Effect Level: | 3.2 mg/l |
| Water Quality: | Soft |
| Temperature: | 22.4°C |
| pH: | 7.49 |
| Hardness (as $CaCO_3$): | 49 mg/l |
| 96 Hr. $LC_{50}$ Ref. Toxicant p,p'-DDT: | 4.03 (3.59 - 4.52) µg/l |
| Notebook Reference: | No. 4627, pages 5, 6 |

Table 90
Percent Mortalities and $LC_{50}$ Values - American Cyanamid Company
Magnifloc 1563C - Bluegill Sunfish

Percent Mortality

| | Control | Test Material, Nominal Conc. mg/l | | | | |
|---|---|---|---|---|---|---|
| | | 1.0 | 1.8 | 3.2 | 5.6 | 10.0 |
| 24 hour | 0% | 0% | 0% | 0% | 60% | 100% |
| 48 hour | 0% | 0% | 0% | 0% | 90% | 100% |
| 96 hour | 0% | 0% | 0% | 0% | 90% | 100% |

$LC_{50}$ Values

| | | 24 Hour | 48 Hour | 96 Hour |
|---|---|---|---|---|
| $LC_{50}$, mg/l | | 5.3 | 4.5 | 4.5 |
| 95% Confidence Limits | Low | 4.4 | 4.0 | 4.0 |
| | High | 6.4 | 5.0 | 5.0 |

Observed 96 hour no effect level: 3.2 mg/l.

Table 91
Physical and Chemical Parameters - American Cyanamid Company
Magnifloc 1563C - Bluegill Sunfish

Dilution Water

pH: 7.49 Total Hardness: 49 mg/l as $CaCO_3$
Average Temperature: 22.4°C Total Alkalinity: 23 mg/l as $CaCO_3$
Range: 22.2-22.5°C Conductivity: 156 µmhos/cm

Dissolved Oxygen, mg/l

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 1.0 | 3.2 | 10.0 |
| Initial | 8.6 | 8.8 | 8.9 | 8.8 |
| 48 hour | 6.3 | 6.7 | 6.5 | * |
| 96 hour | 5.9 | 6.7 | 6.1 | * |

pH

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 1.0 | 3.2 | 10.0 |
| Initial | 7.49 | 7.53 | 7.51 | 7.52 |
| 96 hour | 7.15 | 7.21 | 7.21 | * |

*Data not collected after 100% mortality.

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| | |
|---|---|
| Client: | American Cyanamid Company |
| Date: | The test was conducted from 13 December through 17 December 1977. |
| Material: | Magnifloc 1563C |
| UCES Proj. No.: | 11506-47-6 |
| Summary: | The 96 hour $LC_{50}$ is 1.14 mg/l and the observed no effect level is 0.32 mg/l. |
| Species: | Rainbow trout, *Salmo gairdneri* |
| Length: | 40.4 mm |
| Weight: | 0.48 grams |
| Biological Loading: | 0.32 g/l |
| Source: | Washington |
| 96 Hour $LC_{50}$: | 1.14 mg/l |
| 95% Conf. Limits: | 0.95 - 1.36 mg/l |
| No Effect Level: | 0.32 mg/l |
| Water Quality: | Soft |
| Temperature: | 12.0 ± 1°C |
| pH: | 7.53 |
| Hardness (as $CaCO_3$): | 44 mg/l |
| 96 Hr. $LC_{50}$ Ref. Toxicant p,p'-DDT: | 10.59 (8.31 - 13.50) µg/l |
| Notebook Reference: | No. 4627, pages 11, 12 |



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Table 92
Percent Mortalities and $LC_{50}$ Values - American Cyanamid Company
Magnifloc 1563C - Rainbow Trout

Percent Mortality

| | Control | Test Material, Nominal Conc. mg/l | | | | |
|---|---|---|---|---|---|---|
| | | 0.32 | 0.56 | 1.00 | 1.80 | 3.20 |
| 24 hour | 0% | 0% | 0% | 0% | 0% | 30% |
| 48 hour | 0% | 0% | 0% | 0% | 80% | 100% |
| 96 hour | 0% | 0% | 0% | 30% | 100% | 100% |

$LC_{50}$ Values

| | | 24 Hour | 48 Hour | 96 Hour |
|---|---|---|---|---|
| $LC_{50}$, mg/l | | >3.20 | 1.52 | 1.14 |
| 95% Confidence Limits | Low | N.A. | 1.30 | 0.95 |
| | High | N.A. | 1.77 | 1.36 |

Observed 96 hour no effect level: 0.32 mg/l.
N.A. = Not available.

Table 93
Physical and Chemical Parameters - American Cyanamid Company
Magnifloc 1563C - Rainbow Trout

Dilution Water

pH: 7.53 Total Hardness: 44 mg/l as $CaCO_3$
Average Temperature: 12.5°C Total Alkalinity: 36 mg/l as $CaCO_3$
Range: 12.2-13.0°C Conductivity: 140 µmhos/cm

Dissolved Oxygen, mg/l

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 0.32 | 1.00 | 3.20 |
| Initial | 9.9 | 9.8 | 9.6 | 9.6 |
| 48 hour | 9.6 | 9.2 | 9.4 | 9.8 |
| 96 hour | 9.2 | 8.7 | 9.0 | 9.5 |

pH

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 0.32 | 1.00 | 3.20 |
| Initial | 7.53 | 7.53 | 7.56 | 7.51 |
| 96 hour | 7.27 | 7.21 | 7.25 | 7.37 |

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| | |
|---|---|
| Client: | American Cyanamid Company |
| Date: | The test was conducted from 1 February through 5 February 1978. |
| Material: | Superfloc 204 |
| UCES Proj. No. | 11506-47-33 |
| Summary: | The 96 hour $LC_{50}$ of Superfloc 204 to bluegill sunfish is >100.0 mg/l. The 96 hour observed no effect level was 100.0 mg/l. |
| Species: | Bluegill sunfish, Lepomis macrochirus |
| Length: | 38 mm |
| Weight: | 0.68 grams |
| Biological Loading: | 0.45 g/l |
| Source: | Nebraska |
| 96 Hour $LC_{50}$: | >100.0 mg/l |
| 95% Conf. Limits: | Not available |
| No Effect Level: | 100.0 mg/l |
| Water Quality: | Soft |
| Temperature: | 22.5 ± 0.5°C |
| pH: | 7.41 |
| Hardness (as $CaCO_3$): | 44 mg/l |
| 96 Hr. $LC_{50}$ Ref. Toxicant p,p'-DDT: | 4.03 (3.59 - 4.52) µg/l |
| Notebook Reference: | No. 4627, pages 67, 68 |

Table 94
Percent Mortalities and $LC_{50}$ Values - American Cyanamid Company
Superfloc 204 - Bluegill Sunfish

Percent Mortality

| | Control | Test Material, Nominal Conc. mg/l | | | | |
|---|---|---|---|---|---|---|
| 24 hour | 0% | 0% | 0% | 0% | 0% | 0% |
| 48 hour | 0% | 0% | 0% | 0% | 0% | 0% |
| 96 hour | 0% | 0% | 0% | 0% | 0% | 0% |

$LC_{50}$ Values

| | | 24 Hour | 48 Hour | 96 Hour |
|---|---|---|---|---|
| $LC_{50}$, mg/l | | >100.0 | >100.0 | >100.0 |
| 95% Confidence Limits | Low | N.A. | N.A. | N.A. |
| | High | N.A. | N.A. | N.A. |

Observed 96 hour no effect level: 100.0 mg/l.
N.A. = Not available due to lack of mortalities.

Table 95
Physical and Chemical Parameters - American Cyanamid Company
Superfloc 204 - Bluegill Sunfish

Dilution Water

pH: 7.41
Average Temperature: 22.5°C
Range: ±0.5°C

Total Hardness: 44 mg/l as $CaCO_3$
Total Alkalinity: 31 mg/l as $CaCO_3$
Conductivity: 147 µmhos/cm

Dissolved Oxygen, mg/l

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 10.0 | 32.0 | 100.0 |
| Initial | 8.9 | 8.5 | 8.3 | 8.4 |
| 48 hour | 4.7 | 5.2 | 4.6 | 4.8 |
| 96 hour | 5.8 | 5.9 | 5.5 | 5.7 |

pH

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 10.0 | 32.0 | 100.0 |
| Initial | 7.41 | 7.44 | 7.44 | 7.42 |
| 96 hour | 7.09 | 7.13 | 7.06 | 7.08 |

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| | |
|---|---|
| Client: | American Cyanamid Company |
| Date: | The test was conducted from 10 February through 14 February 1978. |
| Material: | Superfloc 204 |
| UCES Proj. No.: | 11506-47-34 |
| Summary: | The 96 hour $LC_{50}$ of Superfloc 204 to rainbow trout is >100.0 mg/l. The 96 hour observed no effect level is 100.0 mg/l. |
| Species: | Rainbow trout, Salmo gairdneri |
| Length: | 45 mm |
| Weight: | 0.76 grams |
| Biological Loading: | 0.51 g/l |
| Source: | Washington |
| 96 Hour $LC_{50}$: | >100.0 mg/l |
| 95% Conf. Limits: | Not available |
| No Effect Level: | 100.0 mg/l |
| Water Quality: | Soft |
| Temperature: | 12.2 ± 0.3°C |
| pH: | 7.47 |
| Hardness (as $CaCO_3$): | 42 mg/l |
| 96 Hr. $LC_{50}$ Ref. Toxicant p,p'-DDT: | 10.59 (8.31 - 13.50) µg/l |
| Notebook Reference: | No. 4627, pages 69, 70 |

Table 96
Percent Mortalities and $LC_{50}$ Values - American Cyanamid Company
Superfloc 204 - Rainbow Trout

Percent Mortality

| | Control | Test Material, Nominal Conc. mg/l | | | | |
|---|---|---|---|---|---|---|
| 24 hour | 0% | 0% | 0% | 0% | 0% | 0% |
| 48 hour | 0% | 0% | 0% | 0% | 0% | 0% |
| 96 hour | 0% | 0% | 0% | 0% | 0% | 0% |

$LC_{50}$ Values

| | | 24 Hour | 48 Hour | 96 Hour |
|---|---|---|---|---|
| $LC_{50}$, mg/l | | >100.0 | >100.0 | >100.0 |
| 95% Confidence Limits | Low | N.A. | N.A. | N.A. |
| | High | N.A. | N.A. | N.A. |

Observed 96 hour no effect level: 100.0 mg/l.
N.A. = Not available due to lack of mortalities.

Table 97
Physical and Chemical Parameters - American Cyanamid Company
Superfloc 204 - Rainbow Trout

Dilution Water

pH: 7.47
Average Temperature: 12.2°C
Range: ±0.3°C

Total Hardness: 42 mg/l as $CaCO_3$
Total Alkalinity: 35 mg/l as $CaCO_3$
Conductivity: 145 µmhos/cm

Dissolved Oxygen, mg/l

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 10.0 | 32.0 | 100.0 |
| Initial | 9.3 | 9.1 | 9.1 | 9.0 |
| 48 hour | 7.4 | 7.8 | 7.7 | 7.3 |
| 96 hour | 8.5 | 8.1 | 7.7 | 7.7 |

pH

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 10.0 | 32.0 | 100.0 |
| Initial | 7.47 | 7.47 | 7.49 | 7.46 |
| 96 hour | 7.18 | 7.15 | 7.14 | 7.12 |

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| | |
|---|---|
| Client: | American Cyanamid Company |
| Date: | The test was conducted from 1 February through 5 February 1978. |
| Material: | Superfloc A130 |
| UCES Proj. No. | 11506-47-35 |
| Summary: | The 96 hour $LC_{50}$ of Superfloc A130 to bluegill sunfish is >100.0 mg/l. The 96 hour observed no effect level is 56.0 mg/l. |
| Species: | Bluegill sunfish, Lepomis macrochirus |
| Length: | 30 mm |
| Weight: | 0.39 grams |
| Biological Loading: | 0.26 g/l |
| Source: | Nebraska |
| 96 Hour $LC_{50}$: | >100.0 mg/l |
| 95% Conf. Limits: | Not available |
| No Effect Level: | 56.0 mg/l |
| Water Quality: | Soft |
| Temperature: | 22.5 ± 0.5°C |
| pH: | 7.44 |
| Hardness (as $CaCO_3$): | 44 mg/l |
| 96 Hr. $LC_{50}$ Ref. Toxicant p,p'-DDT: | 4.03 (3.59 - 4.52) µg/l |
| Notebook Reference: | No. 4627, pages 75, 76 |



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Table 98
Percent Mortalities and $LC_{50}$ Values - American Cyanamid Company
Superfloc A130 - Bluegill Sunfish

Percent Mortality

| | Control | Test Material, Nominal Conc. mg/l | | | | |
|---|---|---|---|---|---|---|
| | | 10.0 | 18.0 | 32.0 | 56.0 | 100.0 |
| 24 hour | 0% | 0% | 0% | 0% | 0% | 0% |
| 48 hour | 0% | 0% | 0% | 0% | 0% | 0% |
| 96 hour | 0% | 0% | 0% | 0% | 0% | 10% |

$LC_{50}$ Values

| | | 24 Hour | 48 Hour | 96 Hour |
|---|---|---|---|---|
| $LC_{50}$, mg/l | | >100.0 | >100.0 | >100.0 |
| 95% Confidence Limits | Low | N.A. | N.A. | N.A. |
| | High | N.A. | N.A. | N.A. |

Observed 96 hour no effect level: 56.0 mg/l.
N.A. = Not available due to lack of sufficient mortalities.

Table 99
Physical and Chemical Parameters - American Cyanamid Company
Superfloc A130 - Bluegill Sunfish

Dilution Water

pH: 7.44
Average Temperature: 22.5°C
Range: ±0.5°C

Total Hardness: 44 mg/l as $CaCO_3$
Total Alkalinity: 31 mg/l as $CaCO_3$
Conductivity: 147 µmhos/cm

Dissolved Oxygen, mg/l

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 10.0 | 32.0 | 100.0 |
| Initial | 8.9 | 8.8 | 8.5 | 8.5 |
| 48 hour | 6.7 | 6.7 | 5.4 | 5.1 |
| 96 hour | 7.5 | 6.9 | 5.5 | 4.2 |

pH

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 10.0 | 32.0 | 100.0 |
| Initial | 7.44 | 7.44 | 7.43 | 7.42 |
| 96 hour | 7.30 | 7.27 | 7.13 | 7.02 |

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| | |
|---|---|
| Client: | American Cyanamid Company |
| Date: | The test was conducted from 25 January through 29 January 1976. |
| Material: | Superfloc A130 |
| UCES Proj. No.: | 11506-47-35 |
| Summary: | The 96 hour $LC_{50}$ is greater than 100.0 mg/l and the observed no effect level is 18.0 mg/l. |

| | |
|---|---|
| Species: | Rainbow trout, *Salmo gairdneri* |
| Length: | 37 mm |
| Weight: | 0.31 grams |
| Biological Loading: | 0.21 g/l |
| Source: | Washington |
| 96 Hour $LC_{50}$: | >100.0 mg/l |
| 95% Conf. Limits: | Not available |
| No Effect Level: | 18.0 mg/l |
| Water Quality: | Soft |
| Temperature: | 12.0 ± 1°C |
| pH: | 7.55 |
| Hardness (as $CaCO_3$): | 44 mg/l |
| 96 Hr. $LC_{50}$ Ref. Toxicant p,p'-DDT: | 10.59 (8.31 - 13.50) µg/l |
| Notebook Reference: | No. 4627, pages 57, 58 |

Table 100
Percent Mortalities and LC50 Values - American Cyanamid Company
Superfloc A130 - Rainbow Trout

Percent Mortality

| | Control | Test Material, Nominal Conc. mg/l | | | | |
|---|---|---|---|---|---|---|
| | | 10.0 | 18.0 | 32.0 | 56.0 | 100.0 |
| 24 hour | 0% | 0% | 0% | 0% | 0% | 0% |
| 48 hour | 0% | 0% | 0% | 0% | 0% | 0% |
| 96 hour | 10% | 0% | 0% | 0% | 0% | 30% |

$LC_{50}$ Values

| | | 24 Hour | 48 Hour | 96 Hour |
|---|---|---|---|---|
| $LC_{50}$, mg/l | | >100.0 | >100.0 | >100.0 |
| 95% Confidence Limits | Low | N.A. | N.A. | N.A. |
| | High | N.A. | N.A. | N.A. |

Observed 96 hour no effect level: 18.0 mg/l.
N.A. = Not available.

Table 101
Physical and Chemical Parameters - American Cyanamid Company
Superfloc A130 - Rainbow Trout

Dilution Water

pH: 7.55 Total Hardness: 44 mg/l as $CaCO_3$
Average Temperature: 12.3°C Total Alkalinity: 33 mg/l as $CaCO_3$
Range: 12.0-12.4°C Conductivity: 150 µmhos/cm

Dissolved Oxygen, mg/l

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 10.0 | 32.0 | 100.0 |
| Initial | 9.7 | 9.8 | 9.3 | 9.3 |
| 48 hour | 8.9 | 8.3 | 8.2 | 8.0 |
| 96 hour | 9.4 | 8.7 | 8.0 | 7.9 |

pH

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 10.0 | 32.0 | 100.0 |
| Initial | 7.55 | 7.59 | 7.55 | 7.56 |
| 96 hour | 7.40 | 7.33 | 7.35 | 7.34 |

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| | |
|---|---|
| Client: | American Cyanamid Company |
| Date: | The test was conducted from 24 January through 28 January 1978. |
| Material: | Superfloc N100 |
| UCES Proj. No. | 11506-47-37 |
| Summary: | The 96 hour $LC_{50}$ is greater than 100 mg/l and fish behavior appeared normal at all concentrations tested. |
| Species: | Bluegill sunfish, Lepomis macrochirus |
| Length: | 34 mm |
| Weight: | 0.44 grams |
| Biological Loading: | 0.29 g/l |
| Source: | Nebraska |
| 96 Hour $LC_{50}$: | >100.0 mg/l |
| 95% Conf. Limits: | Not available |
| No Effect Level: | 100.0 mg/l |
| Water Quality: | Soft |
| Temperature: | 22.0 ± 2°C |
| pH: | 7.43 |
| Hardness (as $CaCO_3$): | 44 mg/l |
| 96 Hr. $LC_{50}$ Ref. Toxicant p,p'-DDT: | 4.03 (3.59 - 4.52) µg/l |
| Notebook Reference: | No. 4627, pages 61, 62 |

Table 102
Percent Mortalities and $LC_{50}$ Values - American Cyanamid Company
Superfloc N100 - Bluegill Sunfish

Percent Mortality

| | Control | Test Material, Nominal Conc. mg/l | | | | |
|---|---|---|---|---|---|---|
| | | 10.0 | 18.0 | 32.0 | 56.0 | 100.0 |
| 24 hour | 0% | 0% | 0% | 0% | 0% | 0% |
| 48 hour | 0% | 0% | 0% | 0% | 0% | 0% |
| 96 hour | 0% | 0% | 0% | 0% | 0% | 0% |

$LC_{50}$ Values

| | | 24 Hour | 48 Hour | 96 Hour |
|---|---|---|---|---|
| $LC_{50}$, mg/l | | >100.0 | >100.0 | >100.0 |
| 95% Confidence Limits | Low | N.A. | N.A. | N.A. |
| | High | N.A. | N.A. | N.A. |

Observed 96 hour no effect level: 100.0 mg/l.
N.A. = Not available.

Table 103
Physical and Chemical Parameters - American Cyanamid Company
Superfloc N100 - Bluegill Sunfish

Dilution Water

pH: 7.43 Total Hardness: 44 mg/l as $CaCO_3$
Average Temperature: 21.7°C Total Alkalinity: 33 mg/l as $CaCO_3$
Range: 21.0-22.0°C Conductivity: 150 μmhos/cm

Dissolved Oxygen, mg/l

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 10.0 | 32.0 | 100.0 |
| Initial | 8.8 | 8.6 | 8.7 | 8.5 |
| 48 hour | 7.0 | 6.0 | 6.5 | 6.2 |
| 96 hour | 7.0 | 5.9 | 5.9 | 5.8 |

pH

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 10.0 | 32.0 | 100.0 |
| Initial | 7.43 | 7.41 | 7.53 | 7.51 |
| 96 hour | 7.23 | 7.13 | 7.12 | 7.07 |

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| | |
|---|---|
| Client: | American Cyanamid Company |
| Date: | The test was conducted from 24 January through 28 January 1978. |
| Material: | Superfloc N100 |
| UCES Proj. No.: | 11506-47-38 |
| Summary: | The 96 hour $LC_{50}$ is greater than 100.0 mg/l and the observed no effect level is 18.0 mg/l. |
| Species: | Rainbow trout, Salmo gairdneri |
| Length: | 39 mm |
| Weight: | 0.43 grams |
| Biological Loading: | 0.29 g/l |
| Source: | Washington |
| 96 Hour $LC_{50}$: | >100.0 mg/l |
| 95% Conf. Limits: | Not available |
| No Effect Level: | 18.0 mg/l |
| Water Quality: | Soft |
| Temperature: | 12.0 ± 1°C |
| pH: | 7.41 |
| Hardness (as $CaCO_3$): | 44 mg/l |
| 96 Hr. $LC_{50}$ Ref. Toxicant p,p'-DDT: | 10.59 (8.31 - 13.50) µg/l |
| Notebook Reference: | No. 4627, pages 59, 60 |

Table 104
Percent Mortalities and $LC_{50}$ Values - American Cyanamid Company
Superfloc N100 - Rainbow Trout

Percent Mortality

| | Control | Test Material, Nominal Conc. mg/l | | | | |
|---|---|---|---|---|---|---|
| | | 10.0 | 18.0 | 32.0 | 56.0 | 100.0 |
| 24 hour | 0% | 0% | 0% | 0% | 0% | 0% |
| 48 hour | 0% | 0% | 0% | 0% | 0% | 0% |
| 96 hour | 0% | 0% | 0% | 0% | 0% | 0% |

$LC_{50}$ Values

| | | 24 Hour | 48 Hour | 96 Hour |
|---|---|---|---|---|
| $LC_{50}$, mg/l | | >100.0 | >100.0 | >100.0 |
| 95% Confidence Limits | Low | N.A. | N.A. | N.A. |
| | High | N.A. | N.A. | N.A. |

Observed 96 hour no effect level: 18.0 mg/l.
N.A. = Not available.

Table 105
Physical and Chemical Parameters - American Cyanamid Company
Superfloc N100 - Rainbow Trout

Dilution Water

pH: 7.41 Total Hardness: 44 mg/l as $CaCO_3$
Average Temperature: 12.1°C Total Alkalinity: 33 mg/l as $CaCO_3$
Range: 12.0-12.2°C Conductivity: 150 µmhos/cm

Dissolved Oxygen, mg/l

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 10.0 | 32.0 | 100.0 |
| Initial | 8.8 | 8.8 | 8.8 | 8.7 |
| 48 hour | 9.0 | 8.7 | 9.0 | 9.1 |
| 96 hour | 10.0 | 9.0 | 9.3 | 9.2 |

pH

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 10.0 | 32.0 | 100.0 |
| Initial | 7.41 | 7.42 | 7.43 | 7.38 |
| 96 hour | 7.36 | 7.26 | 7.36 | 7.31 |

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| | |
|---|---|
| Client: | American Cyanamid Company |
| Date: | The test was conducted from 1 February through 5 February 1978. |
| Material: | Cyanatrol WF950S |
| UCES Proj. No. | 11506-47-39 |
| Summary: | The 96 hour $LC_{50}$ of WF950S to bluegill sunfish is >100.0 mg/l. The 96 hour observed no effect level is 56.0 mg/l. |
| Species: | Bluegill sunfish, Lepomis macrochirus |
| Length: | 32 mm |
| Weight: | 0.36 grams |
| Biological Loading: | 0.24 g/l |
| Source: | Nebraska |
| 96 Hour $LC_{50}$: | >100.0 mg/l |
| 95% Conf. Limits: | Not available |
| No Effect Level: | 56.0 mg/l |
| Water Quality: | Soft |
| Temperature: | 22.5 ± 0.5°C |
| pH: | 7.44 |
| Hardness (as $CaCO_3$): | 44 mg/l |
| 96 Hr. $LC_{50}$ Ref. Toxicant p,p'-DDT: | 4.03 (3.59 - 4.52) µg/l |
| Notebook Reference: | No. 4627, pages 71, 72 |

Table 106
Percent Mortalities and $LC_{50}$ Values - American Cyanamid Company
Cyanatrol WF950S - Bluegill Sunfish

Percent Mortality

| | Control | Test Material, Nominal Conc. mg/l | | | | |
|---|---|---|---|---|---|---|
| | | 10.0 | 18.0 | 32.0 | 56.0 | 100.0 |
| 24 hour | 0% | 0% | 0% | 0% | 0% | 0% |
| 48 hour | 0% | 0% | 0% | 0% | 0% | 0% |
| 96 hour | 0% | 0% | 0% | 0% | 0% | 30% |

$LC_{50}$ Values

| | | 24 Hour | 48 Hour | 96 Hour |
|---|---|---|---|---|
| $LC_{50}$, mg/l | | >100.0 | >100.0 | >100.0 |
| 95% Confidence Limits | Low | N.A. | N.A. | N.A. |
| | High | N.A. | N.A. | N.A. |

Observed 96 hour no effect level: 56.0 mg/l.
N.A. = Not available.

Table 107
Physical and Chemical Parameters - American Cyanamid Company
Cyanatrol WF950S - Bluegill Sunfish

Dilution Water

pH: 7.44
Average Temperature: 22.5°C
Range: ±0.5°C

Total Hardness: 44 mg/l as $CaCO_3$
Total Alkalinity: 31 mg/l as $CaCO_3$
Conductivity: 147 µmhos/cm

Dissolved Oxygen, mg/l

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 10.0 | 32.0 | 100.0 |
| Initial | 9.0 | 8.5 | 8.0 | 8.8 |
| 48 hour | 6.2 | 4.7 | 2.7 | 1.8 |
| 96 hour | 7.0 | 5.9 | 4.2 | 1.8 |

pH

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 10.0 | 32.0 | 100.0 |
| Initial | 7.44 | 7.44 | 7.42 | 7.41 |
| 96 hour | 7.24 | 7.09 | 6.98 | 6.83 |

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| | |
|---|---|
| Client: | American Cyanamid Company |
| Date: | The test was conducted from 10 February through 14 February 1978. |
| Material: | Cyanatrol WF950S |
| UCES Proj. No.: | 11506-47-40 |
| Summary: | The 96 hour $LC_{50}$ for Cyanatrol WF950S to rainbow trout is >100.0 mg/l. The 96 hour observed no effect level is 18.0 mg/l. |
| Species: | Rainbow trout, Salmo gairdneri |
| Length: | 43 mm |
| Weight: | 0.63 grams |
| Biological Loading: | 0.42 g/l |
| Source: | Washington |
| 96 Hour $LC_{50}$: | >100.0 mg/l |
| 95% Conf. Limits: | Not available |
| No Effect Level: | 18.0 mg/l |
| Water Quality: | Soft |
| Temperature: | 12.2 ± 0.3°C |
| pH: | 7.48 |
| Hardness (as $CaCO_3$): | 42 mg/l |
| 96 Hr. $LC_{50}$ Ref. Toxicant p,p'-DDT: | 10.59 (8.31 - 13.50) µg/l |
| Notebook Reference: | No. 4627, pages 73, 74 |

Table 108
Percent Mortalities and $LC_{50}$ Values - American Cyanamid Company
Cyanatrol WF950S - Rainbow Trout

Percent Mortality

| | Control | Test Material, Nominal Conc. mg/l | | | | |
|---|---|---|---|---|---|---|
| | | 10.0 | 18.0 | 32.0 | 56.0 | 100.0 |
| 24 hour | 0% | 0% | 0% | 0% | 0% | 0% |
| 48 hour | 0% | 0% | 0% | 0% | 0% | 0% |
| 96 hour | 0% | 0% | 0% | 0% | 0% | 0% |

$LC_{50}$ Values

| | | 24 Hour | 48 Hour | 96 Hour |
|---|---|---|---|---|
| $LC_{50}$, mg/l | | >100.0 | >100.0 | >100.0 |
| 95% Confidence Limits | Low | N.A. | N.A. | N.A. |
| | High | N.A. | N.A. | N.A. |

Observed 96 hour no effect level: 18.0 mg/l.
N.A. = Not available.

Table 109
Physical and Chemical Parameters - American Cyanamid Company
Cyanatrol WF950S - Rainbow Trout

Dilution Water

pH: 7.48
Average Temperature: 12.2°C
Range: ±0.3°C

Total Hardness: 42 mg/l as $CaCO_3$
Total Alkalinity: 35 mg/l as $CaCO_3$
Conductivity: 145 μmhos/cm

Dissolved Oxygen, mg/l

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 10.0 | 32.0 | 100.0 |
| Initial | 9.4 | 9.3 | 9.1 | 8.9 |
| 48 hour | 8.5 | 8.2 | 7.3 | 7.2 |
| 96 hour | 9.1 | 8.0 | 6.3 | 3.8 |

pH

| | Control | Test Material, Nom. Conc. mg/l | | |
|---|---|---|---|---|
| | | 10.0 | 32.0 | 100.0 |
| Initial | 7.48 | 7.51 | 7.50 | 7.45 |
| 96 hour | 7.27 | 7.14 | 7.00 | 6.84 |

# Appendix I
## American Cyanamid Company
## Behavioral Observations and Observed No Effect Levels

It should be noted that observations are based on behavior and may not necessarily be related to mortalities.
Test values are based on nominal concentration of the chemicals in soft reconstituted water.

### Magnifloc 834A

Bluegill sunfish

96 hour observed no effect level: 56.0 mg/l.

Behavioral observations: Bluegill sunfish exposed to Magnifloc 834A at concentrations of 100.0 mg/l exhibited irritation.

Rainbow trout

96 hour observed no effect level: 10.0 mg/l.

Behavioral observations: Rainbow trout exposed to Magnifloc 834A at concentrations of 18.0 mg/l and higher became irritated and exhibited abnormal sounding behavior.

### Magnifloc 837A

Bluegill sunfish

96 hour observed no effect level: 100.0 mg/.

Behavioral observations: No abnormal behavior was observed at any concentration of Magnifloc 837A in the bluegill sunfish test at the 96 hour period.

Rainbow trout

96 hour observed no effect level: 18.0 mg/l.

Behavioral observations: Rainbow trout exposed to Magnifloc 837A at concentrations of 32.0 mg/l and higher were irritated; in addition, trout at 56.0 mg/l and higher exhibited abnormal surfacing behavior at the 96 hour period.

# Appendix I
## American Cyanamid Company
## Behavioral Observations and Observed No Effect Levels

### Magnifloc 900N

**Bluegill sunfish**

96 hour observed no effect level: 100.0 mg/l.

Behavioral observations: No abnormal behavior was observed for bluegill sunfish in any concentration at the 96 hour period.

**Rainbow trout**

96 hour observed no effect level: 56.0 mg/l.

Behavioral observations: Rainbow trout exposed to Magnifloc 900N at the 100.0 mg/l concentration exhibited abnormal surfacing behavior at the 96 hour period.

### Magnifloc 515C

**Bluegill sunfish**

96 hour observed no effect level: <56.0 mg/l

Behavioral observations: Bluegill sunfish exposed to Magnifloc 515C at 180.0 mg/l were quiescent and irritated at the 96 hour period.

**Rainbow trout**

96 hour observed no effect level: 56.0 mg/l.

Behavioral observations: Rainbow trout exposed to Magnifloc 515C at concentrations of 100.0 mg/l and higher exhibited abnormal surfacing behavior at the 96 hour period.

# Appendix I
## American Cyanamid Company
## Behavioral Observations and Observed No Effect Levels

### Magnifloc 507C

**Bluegill sunfish**

96 hour observed no effect level: 18.0 mg/l.

Behavioral observations: Bluegill sunfish exposed to Magnifloc 507C at the 32.0 mg/l concentration exhibited abnormal quiescence at the 96 hour period.

**Rainbow trout**

96 hour observed no effect levels:

| | | | |
|---|---|---|---|
| Test 1: | <18.0 mg/l. | Test 4: | 5.6 mg/l. |
| Test 2: | 5.6 mg/l. | Test 5: | 10.0 mg/l. |
| Test 3: | N.A. | Test 6: | 10.0 mg/l. |

Behavioral observations: Rainbow trout exposed to Magnifloc 507C exhibited varying responses to the concentrations tested throughout the six tests.

In Test 1 (9-13 January 1978) fish exposed to concentrations of 18.0 mg/l exhibited irritation, rapid respiration and abnormal surfacing at the 96 hour period.

In Test 2 (16-20 January 1978) fish exposed to concentrations of 10.0 mg/l and higher were abnormally quiescent at the 96 hour period.

In Test 3 (24-28 January 1978) no 96 hour behavioral observations could be made due to early termination of the test.

In Test 4 (9-13 February 1978) fish exposed to 10.0 mg/l were irritated while fish exposed to concentrations of 18.0 mg/l and higher were irritated with labored respiration and abnormal sounding behavior observed at the 96 hour period.

In Test 5 (14-18 February 1978) trout exposed to concentrations of 18.0 mg/l and 32.0 mg/l were irritated and exhibited abnormal surfacing behavior while fish at the 100.0 mg/l concentration were darkly discolored with irregular respiration and exhibited abnormal sounding and swimming on their sides at the 96 hour period.

In Test 6 (20-24 March 1978) fish exposed to concentrations of 18.0 mg/l and higher were irritated while at 32.0 mg/l and higher exhibited abnormal surfacing behavior and at the 56.0 mg/l and higher concentrations fish exhibited skittering swimming behavior at the 96 hour period.

N.A. = Not available due to early termination of the test.

# Appendix I
## American Cyanamid Company
## Behavioral Observations and Observed No Effect Levels

### Magnifloc 521C

**Bluegill sunfish**

96 hour observed no effect level: 0.56 mg/l.

Behavioral observations: No abnormal behavior was observed of the remaining bluegill sunfish in the concentrations of Magnifloc 521C at the 96 hour period.

**Rainbow trout**

96 hour observed no effect level: 0.18 mg/l.

Behavioral observations: Rainbow trout exposed to Magnifloc 521C at the 0.56 mg/l concentration exhibited irritation at the 96 hour period.

### Magnifloc 2535C

**Bluegill sunfish**

96 hour observed no effect level: 5.6 mg/l.

Behavioral observations: Bluegill sunfish exposed to Magnifloc 2535C at concentrations of 18.0 mg/l and higher exhibited abnormal excitability at the 96 hour period.

**Rainbow trout**

96 hour observed no effect level: 1.0 mg/l.

Behavioral observations: Rainbow trout exposed to Magnifloc 2535C at the 1.8 mg/l concentration exhibited abnormal sounding at the 48 hour period and abnormal excitability at the 72 hour period yet appear normal at the 96 hour period. Fish exposed to the 3.2 mg/l concentration exhibited irritation at the 24 hour period and excitability, dark discoloration and abnormal surfacing behavior at the 48, 72 and 96 hour period.

# Appendix I
## American Cyanamid Company
## Behavioral Observations and Observed No Effect Level

### Magnifloc 567C

**Bluegill sunfish**

96 hour observed no effect level: <1.0 mg/l.

Behavioral observations: Bluegill sunfish exposed to Magnifloc 567C at the 1.0 mg/l concentration exhibited abnormal quiescence at the 96 hour period.

**Rainbow trout**

96 hour observed no effect levels:

| | | | |
|---|---|---|---|
| Test 1: | 0.18 mg/l. | Test 4: | 0.018 mg/l. |
| Test 2: | N.A. | Test 5: | 0.0560 mg/l. |
| Test 3: | <0.10 mg/l. | Test 6: | <0.010 mg/l. |

Behavioral observations: Rainbow trout exposed to Magnifloc 567C exhibited varying responses to the concentrations tested throughout the six tests.

In Test 1 (3-7 January 1978) the trout were excitable at 0.32 mg/l, quiescent at 0.56 mg/l and irritated at 1.0 mg/l at the 96 hour period.

The 96 hour observations could not be made for Test 2 (24-26 January 1978) due to the early termination of the test.

In Test 3 (9-13 February 1978) the 96 hour behavioral data could not be collected due to complete mortalities in all concentrations.

In Test 4 (14-18 February 1978) no abnormal behavior was observed in the remaining fish at the 96 hour period.

In Test 5 (27 February-3 March 1978) no abnormal behavior was observed in any of the concentrations at the 96 hour period.

In Test 6 (20-24 March 1978) fish exposed to the 0.010 mg/l concentration exhibited irritation and abnormal sounding behavior at the 96 hour period.

N.A. = Not available due to early termination of the test.

# Appendix I
## American Cyanamid Company
## Behavioral Observations and Observed No Effect Levels

### Magnifloc 581C

Bluegill sunfish

96 hour observed no effect level: 0.32 mg/l.

Behavioral observations: Bluegill sunfish exposed to Magnifloc 581C at the 0.56 mg/l concentration exhibited twitching at the 96 hour period.

Rainbow trout

96 hour observed no effect level: 0.32 mg/l.

Behavioral observations: No abnormal behavior was observed in the remaining concentrations of Magnifloc 581C at the 96 hour period.

### Magnifloc 585C

Bluegill sunfish

96 hour observed no effect level: 0.32 mg/l.

Behavioral observations: Bluegill sunfish exposed to Magnifloc 585C at concentrations of 0.56 mg/l and higher were irritated and fish in the 1.0 mg/l concentration also exhibited abnormal quiescence at the 96 hour period.

Rainbow trout

96 hour observed no effect levels: Test 1: 0.18 mg/l; Test 2: <1.0 mg/l; Test 3: <0.18 mg/l.

Behavioral observations: Rainbow trout exposed to Magnifloc 585C exhibited varying responses to the concentrations tested throughout the three tests.

In Test 1 (21-25 February 1978) trout in concentrations of 0.32 mg/l and higher were irritated with fish in the 0.32 mg/l and 0.56 mg/l concentrations exhibiting abnormal sounding behavior and fish in the 1.0 mg/l concentration exhibiting abnormal surfacing behavior at the 96 hour period.

In Test 2 (27 February-3 March 1978) no behavioral observations could be made at the 96 hour period due to 100% mortality in all test concentrations.

In Test 3 (20-24 March 1978) rainbow trout in concentrations of 0.18 mg/l and higher were irritated and fish in the 0.18 mg/l concentration exhibited abnormal sounding behavior while fish in the 0.32 mg/l concentration exhibited erratic swimming and swimming on their sides.

Behavioral observations noted are based on the recorded observations for the 96 hour test period.

# Appendix I
## American Cyanamid Company
## Behavioral Observations and Observed No Effect Levels

### Magnifloc 591C

**Bluegill sunfish**

96 hour observed no effect level: 0.56 mg/l.

Behavioral observations: Bluegill sunfish exposed to Magnifloc 591C at concentrations of 1.0 mg/l and higher became abnormally quiescent at the 96 hour period.

**Rainbow trout**

96 hour observed no effect level: 0.18 mg/l.

Behavioral observations: Rainbow trout exposed to Magnifloc 591C at the 0.32 mg/l concentration exhibited abnormal irritation while fish in the 0.56 mg/l concentration were darkly discolored at the 96 hour period.

### Magnifloc 1839A

**Bluegill sunfish**

96 hour observed no effect level: 18.0 mg/l.

Behavioral observations: Bluegill sunfish exposed to Magnifloc 1839A at 32.0 mg/l exhibited excitability, at 56.0 mg/l the sunfish exhibited excitability, irritation and abnormal sounding, while at 100.0 mg/l the fish exhibited quiescence, irritation, labored respiration and abnormal surfacing behavior. These observations were recorded at the 96 hour period.

**Rainbow trout**

96 hour observed no effect level: 10.0 mg/l.

Behavioral observations: Rainbow trout exposed to Magnifloc 1839A at concentrations of 18.0 mg/l and higher were excitable, irritated and exhibited abnormal sounding behavior; in addition, fish in the 56.0 mg/l concentration were observed to have rapid respiration with some of the fish exhibiting abnormal surfacing behavior at the 96 hour period.

# Appendix I
## American Cyanamid Company
## Behavioral Observations and Observed No Effect Levels

### Magnifloc 1820A

**Bluegill sunfish**

96 hour observed no effect level: 18.0 mg/l.

Behavioral observations: Bluegill sunfish exposed to Magnifloc 1820A at the 100.0 mg/l concentration were excitable, irritated and exhibited abnormal sounding behavior at the 96 hour period.

**Rainbow trout**

96 hour observed no effect level: 18.0 mg/l.

Behavioral observations: Rainbow trout exposed to Magnifloc 1820A at 32.0 mg/l were excitable and trout at the 56.0 mg/l concentration were excitable and irritated with labored respiration and abnormal sounding behavior at the 96 hour period.

### Magnifloc 1906N

**Bluegill sunfish**

96 hour observed no effect level: 18.0 mg/l.

Behavioral observations: Bluegill sunfish exposed to Magnifloc 1906N were irritated at the 32.0 mg/l and 56.0 mg/l concentrations and abnormal surfacing behavior was observed at the 100.0 mg/l concentration at the 96 hour period.

**Rainbow trout**

96 hour observed no effect level: <10.0 mg/l.

Behavioral observations: Rainbow trout exposed to Magnifloc 1906N at concentrations of 10.0 mg/l and higher exhibited twitching and abnormal surfacing behavior; in addition, trout in the 56.0 mg/l and 100.0 mg/l concentrations were observed to be gulping air at the surface at the 96 hour period.

# Appendix I
## American Cyanamid Company
## Behavioral Observations and Observed No Effect Levels

### Magnifloc 1561C

**Bluegill sunfish**

96 hour observed no effect level: 3.2 mg/l.

Behavioral observations: Bluegill sunfish exposed to Magnifloc 1561C at the 18.0 mg/l concentration exhibited abnormal excitability at the 96 hour period.

**Rainbow trout**

96 hour observed no effect level: <1.8 mg/l.

Behavioral observations: Rainbow trout exposed to Magnifloc 1561C at 1.8 mg/l exhibited excitability and dark discoloration at the 96 hour period. Fish exposed to the 3.2 mg/l concentration exhibited abnormal surfacing and dark discoloration at the 96 hour period.

### Magnifloc 1563C

**Bluegill sunfish**

96 hour observed no effect level: 3.2 mg/l.

Behavioral observations: Bluegill sunfish exposed to Magnifloc 1563C at 5.6 mg/l were abnormally excitable at the 96 hour test period. Previous to the 96 hour period the fish exhibited excitability and abnormal scunding behavior.

**Rainbow trout**

96 hour observed no effect level: 0.32 mg/l.

Behavioral observations: Rainbow trout exposed to concentrations of 1.0 mg/l of Magnifloc 1563C were observed to be abnormally irritated.

# Appendix I
## American Cyanamid Company
## Behavioral Observations and Observed No Effect Levels

### Superfloc N100

**Bluegill sunfish**

96 hour observed no effect level: 100.0 mg/l.

Behavioral observations: Bluegill sunfish exposed to Superfloc N100 exhibited no observable abnormal behavior in any of the test concentrations at the 96 hour period.

**Rainbow trout**

96 hour observed no effect level: 18.0 mg/l.

Behavioral observations: Rainbow trout exposed to Superfloc N100 at concentrations of 32.0 and higher were irritated; in addition, the trout in the 32.0 mg/l concentration were darkly discolored. These observations were recorded at the 96 hour period.

### Cyanatrol WF950S

**Bluegill sunfish**

96 hour observed no effect level: 56.0 mg/l.

Behavioral observations: Bluegill sunfish exposed to Cyanatrol WF950S at a concentration of 100.0 mg/l exhibited erratic swimming and abnormal surfacing behavior with gulping of air at the 96 hour period.

**Rainbow trout**

96 hour observed no effect level: 18.0 mg/l.

Behavioral observations: Rainbow trout exposed to Cyanatrol WF950S at concentrations of 32.0 mg/l and higher were irritated and at 100.0 mg/l abnormal surfacing behavior was also observable at the 96 hour period.

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