DATA EVALUATION RECORD PAGE 1 OF

CASE: GS0333 FENAMIPHOS

CONT-CAT: 01 GUIDELINES: 72-1

MRID: 114015

Lamb, D.; Roney, D. (1972) Acute Toxicity of Nemacur Sulfoxide to Bluegill: Report No. 35010. (Unpublished study received May 1, 1973 under unknown admin. no.; submitted by Mobay Chemical Corp., Kansas City, MO; CDL:120301-AA).

REVIEW RESULTS:

VALID X INVALID ____ INCOMPLETE ____

GUIDELINE: SATISFIED ____ PARTIALLY SATISFIED ___ NOT SATISFIED X

DIRECT RVW TIME = START DATE: END DATE:

REVIEWED BY: Richard W. Felthousen

TITLE: Wildlife Biologist

ORG: EEB/HED

LOC/TEL: 557-1392

SIGNATURE: R. W. Felthousen DATE: 12/03/86

APPROVED BY: O. Gutenson

TITLE: Acting Registration Standard Coordinator

ORG: EEB/HED

LOC/TEL:

SIGNATURE: O. Gutenson DATE: 12/24/87

This study is scientifically sound but may not be used to fulfill this guideline requirement for an acute toxicity study on a warmwater fish species using the technical grade product. The results provide valid information on nemacur sulfoxide, a breakdown product of the parent material.

6 pages

DATA EVALUATION RECORD

1. Chemical: Nemacur sulfoxide

2. Test Material: 99% active ingredient

3. Study Type: 96-hour Static Acute Toxicity Test

   Species Tested: Bluegill Sunfish

4. Study ID: Lamb, D.W. and D.J. Roney. November 1972. Acute Toxicity of Nemacur Sulfoxide to Bluegill. Prepared by Chemagro Division of Baychem Corp. Submitted to Mobay Chemical Corp. Stilwel, Kansas. EPA Accession No. 256004.

5. Reviewed By: Elizabeth E. Zucker, Wildlife Biologist, Ecological Effects Branch/HED — Signature: — Date:

6. Approved By: David Coppage, Supervisory Biologist, Ecological Effects Branch/HED — Signature: — Date:

7. Conclusions:

This study is scientifically sound but may not be used to fulfill a guidelines requirement for an acute toxicity study on a warm water fish using the technical product. The results provide supplemental information on nemacur sulfoxide, a breakdown product of the parent active ingredient.

8. Recommendations:

N/A

9. Background

This study was first evaluated in EEB Review Out: November 25, 1977 by T. O'Brian. The 1977 DER is brief. The study was reevaluated under current standards.

10. Discussion of Individual Test (from Test Report)

A study of the fate of NEMACUR in soil demonstrated that Nemacur was oxidized to its sulfoxide in quantities of 50% after 7 days and 100% after 23 days. Considering the rate of oxidation of Nemacur to the sulfoxide form, and the stability of the sulfoxide, the present study was initiated.

11. Materials and Methods (from Test Report)

A. Test Procedures

Preliminary range finding tests were conducted. For the definitive, four concentrations were prepared. To reach the desired concentrations, aliquots of a stock solution were added to bioassay water. Acetone was used as a solvent. A reference, p, p'DDT, was tested concurrently.

The fish were obtained from commercial hatcheries. Fish were 35 to 75 mm in length and weighed 0.5 to 2.0 g upon arrival. The fish were acclimated to reconstituted deionized water used for the bioassay. Each liter of deionized water was reconstituted with 30 mg of calcium sulfate, 30 mg of magnesium sulfate, 48 mg of sodium bicarbonate and 2 mg of potassium chloride to yield a pH of 6.8 to 7.2. Vessels consisted of 5 gallon wide-mouth glass jars which contained 15 liters of water. Ten fish were placed in each vessel and each vessel represented one concentration. The loading factor was approximately 1 g of fish per liter of water. By means of a water bath, the temperature was maintained at 21°C. During the experiment, the fish were not fed, the water was not aerated, and mortality data were recorded at 24-hour intervals.

B. Statistical Analysis

Approximate LC_{50} values and 95% confidence limits were calculated according to the method of Weil [Carrol S. Weil. Biometrics, 8, 249-263, 1952].

12. Reported Results

Nemacur Sulfoxide

Dose Level (ppm)	Cumulative Mortality 24 Hour	48 Hour	72 Hour	96 Hour
Control	0	0	0	0
1.0	0	0	0	1
1.7	1	1	1	1
2.9	1	6	9	10
4.9	2	9	10	10

13. Study Author's Conclusions

The 96-hour LC_{50} value and 95% confidence limits with Nemacur Sulfoxide were 2.0 (1.8 to 2.3) ppm for bluegill. The sulfoxide was less toxic than the parent material. Nemacur Technical tested under the same conditions had a 96-hour LC_{50} value and 95% confidence limits of 17.7 (14.4 to 21.6) ppb for bluegill.

14. Reviewer's Discussion and Interpretation of the Study

A. Test Procedures

This study was performed under conditions that generally comply with current testing standards with the following notable exceptions:

1. Only 4 concentrations were tested.
2. pH and D.O. were not reported for the test period.
3. Temperature was not adequately monitored.
4. Hardness, alkalinity, and conductivity of diluent were not recorded.
5. Acclimation procedures were not described.
6. The scientific name of the test organisms was not reported.

B. Statistical Analysis

The 96-hour data were analyzed through utilization of Stephan's computerized program. Results are appended.

C. Discussion/Results

This study provides supplemental information relating the toxicological properties of a breakdown product Of Nemacur. Reviewers should consider that diluent characteristics were not described, and D.O., pH, and hardness could effect response. However, the results do suggest that Nemacur sulfoxide is less toxic than the parent active ingredient.

D. Adequacy of Study

1. Classification: Supplemental
2. Rationale: This test was not performed using the technical product. Also only four treatment levels were used and diluent characteristics were not reported.
3. Repairability: None.

Nemacur (ppm)

ZUCKER [redacted] BLUEGILL 96 HR LC50 SULFOXIDE

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CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB.(PERCENT)
4.9	10	10	100	.0976563
2.9	10	10	100	.0976563
1.7	10	1	10	1.07422
1	10	1	10	1.07422

THE BINOMIAL TEST SHOWS THAT 1.7 AND 2.9 CAN BE
USED AS STATISTICALLY SOUND CONSERVATIVE 95 PERCENT
CONFIDENCE LIMITS, BECAUSE THE ACTUAL CONFIDENCE LEVEL
ASSOCIATED WITH THESE LIMITS IS GREATER THAN 95 PERCENT.

AN APPROXIMATE LC50 FOR THIS SET OF DATA IS 2.09876

RESULTS CALCULATED USING THE MOVING AVERAGE METHOD

SPAN	G	LC50	95 PERCENT CONFIDENCE LIMITS	
3	.16572	1.87614	1.37587	2.39273

RESULTS CALCULATED USING THE PROBIT METHOD

ITERATIONS	G	H	GOODNESS OF FIT PROBABILITY
6	5.25003	3.68076	.0252037

SINCE THE PROBABILITY IS LESS THAN 0.05, RESULTS CALCULATED
USING THE PROBIT METHOD PROBABLY SHOULD NOT BE USED.

SLOPE = 7.30117
95 PERCENT CONFIDENCE LIMITS =-9.42796 AND 24.0303

LC50 = 1.9282
95 PERCENT CONFIDENCE LIMITS = 0 AND +INFINITY

LC10 = 1.29184
95 PERCENT CONFIDENCE LIMITS = 0 AND +INFINITY

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