5-4-87
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TDMS DATA EVALUATION RECORD PAGE 1 OF

CASE GS ___ _____ PM ___ ___/___/___

CHEM Diazinon _____

BRANCH EEB DISC ___

FORMULATION Knox Out 2FM (23% ai Microencapsulated)

FICHE/MASTER ID RO0DI009

CITATION: Calmbacher, C.W. (1978a) The Acute Toxicity of Knox Out 2FM to the Rainbow Trout, Salmo Gairdneri Richardson, UCES Project No. 11506-41-06; Prepared, by Union Carbide Environ. Serv.; Submitted y Pennwalt Corp. (Accession No. 240993).

SUBST. CLASS=

OTHER SUBJECT DESCRIPTORS
PRIM:

DIRECT REVIEW TIME= 1 hour (MH) START DATE May 1986 END DATE May 1986

REVIEWED BY: Margaret Rostker H.T. Craven
TITLE: Wildlife Biologist 5/4/87
ORG: EEB
LOC./TEL: 557-7600

SIGNATURE:

APPROVED BY: Harry Craven
TITLE: Supervisory Biologist
ORG: EEB
LOC./TEL: 557-7600

SIGNATURE: Harry T. Craven 5/4/87

The study is core for LC_{50} = .635 ppm ai for Rainbow Trout tested with 23% ai microencapsulated diazinon. This fullfills guideline requirements for testing with 2FM formulated product and coldwater fish.

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DATA EVALUATION RECORD

1. Chemical: Diazinon

2. Formulation: Knox Out 2FM (23% Microencapsulated)

3. Citation: Calmbacher, C.W. (1978a) The Acute Toxicity of Kox Out 2FM to the Rainbow Trout, Salmo Gairdneri Richardson, UCES Project No. 11506-41-06; Prepared by Union Carbide Environ. Serv.; Submitted by Pennwalt Corp. (Accession No. 240993).

4. Reviewed by: John S. Leitzke
Ecologist, Section 3
EEB/HED

5. Date Reviewed: September 11, 1980

6. Test Type: Fish Acute LC_{50}

Test Species: Rainbow Trout (Salmo gairdneri)

7. Reported Results:

96-hour LC_{50} = 60.3 (43.83.2) ppm total test material (23% diazinon).

8. Reviewer's Conclusions:

The 96-hour LC_{50} equals .635 (0.42 to 0.96) nominal ppm active ingredient (ai), indicating a toxicity to coldwater fish. The test is scientifically sound. However, it is unacceptable in meeting the Guidelines minimum requirement for an acute LC_{50} on coldwater fish using the formulation, Knox Out 2FM, and will be reconsidered upon receipt of actual measured concentrations for all test levels.

9. Materials and Methods:

The test material is the formulated product Knox Out 2FM (23% diazinon) since this test using the formulation is required for registration.

Rainbow trout fingerlings (avg wt 1.59 gm; avg l. 56 mm) were assigned 10 to a group in standard, reconstituted water at 12 °C. The loading was 1.06 g/l. Spacing of doses was at 75 to 80 percent increments.

a. Statistical Analysis: The reported dose-response data were analyzed on EEB's TI-59 calculator using the Finney Probit Program (attached).

b. Discussion/Results: There were no control mortality. No major effect on pH was noted, and DO levels were generally within acceptable levels. Major symptoms observed were surfacing, irritation, and erratic swimming.

10. Reviewer's Evaluation:

a. Test Procedures: The test procedure complies with recommended protocols in most respects. Although the loading of 1.06 g/L is higher than the recommended level of 0.8 g/L, this was not considered a serious problem since DO levels usually remained within acceptable levels. The spacing of dose at 75 to 80 percent increments is also greater than recommended, but enough partial mortalities occurred to adequately determine an LC_{50}. Test levels were in terms of nominal concentrations and not measured.

b. Statistical Analysis: There were enough partial mortalities to adequately calculate an LC_{50}, and the Chisquare statistic indicated a homogeneous dose-response relationship within the test groups.

c. Discussion/Results: The nominal, recalculated 24, 48, and 96 hour LC_{50}'s are 256.6, 143.9 and 55.3 ppm total test material, respectively.

d. Validation:

1. Supplemental.

2. Core.

3. Reconsideration upon receipt of actual measured concentrations for all test levels.

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Diazonon-Knox Out
Rbt - 24 hr LC_{50}

UCES	56.	
78	0.	
	10.	
	100.	
	2.	
	10.	
	180.	
	3.	
	10.	
	320.	
	6.	
	10.	
	2.798	M
df=2	-1.741	YINT
	2.277	LW M
	0.879	CHI^2
NS		
	256.522	LD_{50}
	160.881	LOCL
	409.018	UPCL
	89.319	LD_{10}
	49.469	LOCL
	161.270	UPCL
	736.724	LD_{90}
	256.756	LOCL
	2113.919	UPCL

Diazonin-Knox Out
Rbt - 48 hr LC_{50}

UCES		
78		
	56.	
	0.	
	10.	
	100.	
	4.	
	10.	
	180.	
	6.	
	10.	
	320.	
	9.	
	10.	
	3.874	M
	-3.359	YINT
df=2	1.812	LW M
	1.559	CHI^2
NS		
	143.860	LD_{50}
	180.615	LOCL
	190.541	UPCL
	67.141	LD_{10}
	41.957	DOCL
	107.442	UPCL
	308.241	LD_{90}
	189.151	LOCL
	502.308	UPCL

Diazonin-Knox Out
Rbt - 46 hr LC_{50}

UCES	32.	
78	3.	
	10.	
	56.	
	4.	
	10.	
	100.	
	9.	
	10.	
	180.	
	8.	
	10.	
	320.	
	10.	
	10.	
	2.541	M
df=3	0.572	YINT
	2.475	LW M
	3.272	CHI^2
NS		
	55.280	LD_{50}
	36.611	LOCL
	83.469	UPCL
	17.299	LD_{10}
	7.157	LOCL
	41.814	UPCL
	176.655	LD_{90}
	97.002	LOCL
	321.714	UPCL

DATA EVALUATION RECORD

1. Chemical: Diazinon 2FM
Microencapsulated

2. Formulation: Formulated Product

Active Ingredient:
0,0-Diethyl 0-(2-isopropyl-6-methyl-4-pyrimidinyl)phosphorothioate 23%
Inert Ingredients: 77%

3. Citation: Application for Registration of Knox Out® Fire Ant Control Section IX; Fish and Wildlife Safety, (October 1982) Submitted by Agchem Division Pennwalt Corporation. (Accession No. 248821); Registration No. 4581-GLR

4. Reviewed by: Wayne C. Faatz, Ph.D.
Wildlife Biologist

5. Date Reviewed: December 20, 1982

6. Test Type: Rainbow Trout Knox Out® 2FM Insecticide Concentration in Water

Union Carbide Environmental Service Report 11506-41-06.

This report is a supplement to the Data Evaluation Record by J. Leitzke September 11, 1980 on Fish Acute LC_{50}: Rainbow Trout (Salmo gairdneri).

The LC_{50} was determined using nominal ppm active ingredient. Microencapsulated diazinon is a time release insecticide so actual measured concentrations are necessary for the test to be meaningful. The measured concentrations of the toxicant in the original test were not available. EEB is willing to upgrade the aquatic study to acceptable if the toxicant concentrations of the original solutions were available if the toxicant concentrations of the original solutions were available or measurements of new prepared solutions are determined (Faatz August 24, 1981). The registrant chose the latter.

7. Reported Results:

Concentration: 32 mg/L Knox Out 2FM

Sampling Time (hr)	Added mg/L ai	Found mg/L Total	Released	% of Nominal
0	7.4	8.16	0.01	0.135
24	7.4	7.23	0.52	7.02
48	7.4	7.49	0.43	5.81
96	7.4	6.76	0.34	4.59

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The amount of total diazinon found in the water at the 32 mg/L rate was 91 to 110 percent and in the 320 mg/L rate was 93 to 104 percent of what was added. Due to the technique in taking samples of water with suspended capsules and the extraction efficiency, these results fall within the accuracy of the analytical method. About 5 to 7 percent of the total diazinon added was released into the water from 24 through 96 hours at the 32 mg/L rate. At the 320 mg/L rate, the released diazinon increased from 6.5 to 13 percent at 24 hours through 96 hours.

8. Reviewer's Conclusions:

The registrant's conclusions adequately reflect the data presented. However, the registrant did an assay only on the highest and lowest concentrations used in the LC_{50} test, not an assay of all test levels requested. As would be expected under such circumstances the desorption rate of diazinon is not clearly evident. The data is sufficient for assessment purposes and upgraded the study to core status. However, the LC_{50} must be adjusted to reflect the new data. The registrant reported an LC_{50} of 60.3 ppm with the formulated product; whereas, EEB calculated the LC_{50} as 55.3 (36.6 to 83.5). EEB used its LC_{50} value to calculate the nominal LC_{50} for the ai. The 96 hour LC_{50} based upon a 23 percent active ingredient was 12.7 (8.4 to 19.2) ppm.

Since the product is microencapsulated, the pesticide is not immediately available. The data submitted by the registrant indicates that approximately 5 percent of the total diazinon is released into the water by 96 hours at the 32 mg/L concentration. This is approximately one half of the released diazinon at the 320 mg/L concentration. The 5 percent datum is used to calculate the LC_{50} of the adjusted, nominal ai because the 32 mg/L concentration is more representative than the higher concentration.

Therefore using the LC_{50} of the ai calculated by EEB (12.7 (8.4-19.2) ppm), and taking 5 percent of these values which represents the available diazinon at the end of 96 hours yields an LC_{50} .635 (0.42 to 0.96) ppm for the rainbow trout. On this basis encapsulated diazinon can be considered highly toxic to coldwater fish.

The data indicate also that the total amount of diazinon degrades little, if any, at the end of 96 hours.

This adjusted LC_{50} will be noted in EEB's diazinon file and used in future assessments.

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8. Materials and Methods:

Fifteen liters of soft water (hardness 50 mg/L as $CaCO_3$, pH 7.2) were placed in a glass tanks with the water temperature theromostated at 11.5° to 12.5 °C. Knox Out 2FM was added at 32 mg/L in one tank and 320 mg/L in the other tank. Samples were taken at intervals of 0, 24, 48, and 96 hours and the concentrations determined for total and release diazinon.

Statistical Analysis: No analysis was done or needed.

9. Reviewer's Evaluation:

a. Test Procedure: The test procedure was adequate though the value of the information could have been enhanced if all test concentrations were measured for the amount of active ingredient in solution. The information provided is adequate for a hazard assessment.

b. Statistical Analysis: Statistical analysis is not needed.

c. Discussion/Results: Based on the information. (See Reviewers Conclusions) the LC_{50} is 0.653 (0.42 to 0.96) ppm for rainbow trout, active ingredient. The files will be noted as to the change in the LC_{50}.

d. Conclusions:

1. Category: Upgraded to Core upon the acceptance of a revised LC_{50} .635 (0.42 to 0.96) ppm.

2. Rationale: Data was provided as to the expected amount of diazion in solution.

3. Repairability: None.

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