

⑥ 2-EEB-30 b

Document Number

Reviewer



2001065

12-20-02
12/16/93
MRID No. 429490-02
I V-a. MYS

DATA EVALUATION RECORD

- 1. **CHEMICAL:** Proxel Press Paste (Benzisothiazolin).
Shaughnessey No. 098901.
- 2. **TEST MATERIAL:** Proxel press paste; 1,2-benzisothiazol-3(2H)-one; CAS No. 2634-33-5; purity of 76.1% w/w; a moist brown powder
- 3. **STUDY TYPE:** 72-3. Estuarine Shrimp Acute Static Test.
Species Tested: Mysid Shrimp (*Mysidopsis bahia*).
- 4. **CITATION:** Kent, S.J., G.C. Roberts, and R.D. Stanley. 1993. Proxel Press Paste: Acute Toxicity to Mysid Shrimp (*Mysidopsis bahia*). Project ID No. X060/C. Prepared by Brixham Environmental Laboratory, ZENECA Limited, Brixham, Devon, UK. Submitted by ZENECA Inc., Wilmington, DE. EPA MRID No. 429490-02.

5. **REVIEWED BY:**

Mark A. Mossler, M.S.
Associate Scientist
KBN Engineering and
Applied Sciences, Inc.

Signature:

Date:

12/10/93

6. **APPROVED BY:**

Rosemary Graham Mora, M.S.
Associate Scientist
KBN Engineering and
Applied Sciences, Inc.

Signature:

Date:

12/10/93

Henry T. Craven, M.S.
Supervisor, EEB/EFED
USEPA

Signature:

Date:

12/20/02

- 7. **CONCLUSIONS:** This study is scientifically sound and meets the guideline requirements for an acute toxicity test using mysid shrimp. Based on mean measured concentrations, the 96-hour LC₅₀ was 1300 µg proxel press paste/l. Therefore, proxel press paste is classified as moderately toxic to mysid shrimp. The NOEC was 330 µg proxel press paste/l. *Actual Toxicity of purified a. may not be reflected by this test value.*
- 8. **RECOMMENDATIONS:** N/A.
- 9. **BACKGROUND:**
- 10. **DISCUSSION OF INDIVIDUAL TESTS:** N/A.

L D

11. MATERIALS AND METHODS:

- A. **Test Animals:** Young mysids (<24 hours old) were obtained from in-house cultures. Brooding adults were cultured under test conditions (i.e., dilution water, salinity, temperature, and photoperiod). Offspring were collected for testing over a 24-hour period immediately prior to test initiation.
- B. **Test System:** The test was conducted under static conditions. The test chambers were covered, glass beakers with a solution volume of 800 ml. The test was conducted in a temperature-controlled room maintained at $25 \pm 1^\circ\text{C}$. The laboratory environment was maintained on a 16-hour daylight photoperiod (600 lux) with 15-minute transitions.

Natural seawater, collected from Tor Bay, Devon, was adjusted to a salinity of 20 ± 2 parts per thousand (ppt) with dechlorinated water. The water was filtered ($10 \mu\text{m}$) and aged one week before use as test dilution water.

Primary and secondary stock solutions were prepared in dilution water. The treatment solutions were prepared by adding appropriate amounts of the secondary stocks to dilution water.

- C. **Dosage:** Ninety-six-hour, static test. Eleven nominal concentrations (32, 56, 100, 180, 320, 560, 1000, 1800, 3200, 5600, and 10,000 μg proxel press paste/l) and a dilution water control were selected for testing.
- D. **Design:** Ten mysids were randomly allocated to each test container. The mysids were fed live brine shrimp nauplii daily during the test.

Observations of mortality were made at 24, 48, 72, and 96 hours. Dead mysids were removed. The dissolved oxygen concentration (DO) of each test solution was measured every other day. The pH of each solution and salinity of the highest-concentration and control solution were measured at test initiation and termination. Temperature was measured daily in each vessel. The temperature of a chamber containing dilution water was recorded hourly.

Samples collected at 0, 48, and 96 hours were analyzed for 1,2-benzisothiazol-3(2H)-one using high pressure liquid chromatography (HPLC).

E. **Statistics:** The 96-hour median lethal concentration (LC_{50}) and confidence interval (C.I.) were calculated using the moving average angle method.

12. **REPORTED RESULTS:** Due to HPLC malfunctions during the 48-hour sample analysis, only the 0- and 96-hour measured concentrations were used to determine the mean measured concentrations. The mean measured concentrations were <38, 59, 95, 180, 330, 410, 810, 1800, 3400, 6100, and 10,000 μg proxel press paste/l (Table 1, attached). These values were 73-109% of nominal concentrations.

There was no mortality in the control or five lowest-concentration treatment groups (Table 2, attached). The 96-hour LC_{50} value was 1300 μg proxel press paste/l (95% C.I.= 900-1800 μg proxel press paste/l). The no-observed-effect concentration (NOEC) was 330 μg proxel press paste/l.

During the test, the DO was 7.3-8.0 mg/l. The pH was 7.88-8.08 and the temperature ranged from 24.5 to 25.6°C. Salinity was maintained at 20 \pm 1 ppt.

13. **STUDY AUTHOR'S CONCLUSIONS/QUALITY ASSURANCE MEASURES:**
No conclusions were presented.

Good Laboratory Practice and Quality Assurance statements were included in the report stating compliance with OECD principles and, indirectly, with 40 CFR Part 160.

14. **REVIEWER'S DISCUSSION AND INTERPRETATION OF STUDY RESULTS:**

- A. **Test Procedure:** The test procedures were generally in accordance with the SEP, except for the following:

The test temperature (25 \pm 1°C) was greater than recommended (22°C).

The salinity of the dilution water in the study was approximately 20 ppt. The recommended salinity for estuarine shrimp is 10-17 ppt.

- B. **Statistical Analysis:** The reviewer assumes that corrections were made to the analytical results so that results are in terms of the total product (proxel press paste). Using mean measured concentration of proxel press paste data, the reviewer used EPA's Toxanal program to determine the 96-hour LC_{50} and obtained a slightly less conservative result than the authors (see attached printout).

C. Discussion/Results: This study is scientifically sound and meets the guideline requirements for an acute toxicity test using mysid shrimp. Based on mean measured concentrations, the 96-hour LC₅₀ was 1300 µg proxel press paste/l. Therefore, proxel press paste is classified as moderately toxic to mysid shrimp. The NOEC was 330 µg proxel press paste/l.

D. Adequacy of the Study:

(1) Classification: Core.

(2) Rationale: N/A.

(3) Repairability: N/A.

15. COMPLETION OF ONE-LINER FOR STUDY: Yes, 12-6-93.

TABLE 1

PROXEL PRESS PASTE: ACUTE TOXICITY TO MYSID SHRIMP

ANALYTICAL RESULTS

Sponsor:	ZENECA Biocides
Test substance:	Proxel press paste
Test organism:	Mysid shrimp (<i>Mysidopsis bahia</i>)
Test water:	20‰ salinity sea water

Nominal concn. of Proxel press paste (µg/l)	Measured concn. of Proxel press paste (µg/l)				% of nominal
	0 h	48 h	96 h	Mean	
Dilution water control	<36	ND	<36	<36	
32***	39	ND	<36	<38	<119
56***	67*	ND	51	59	105
100	100	ND	90	95	95
180	190	ND	160	180	100
320	340	ND	310	330	103
560	580	ND	230	410	73
1000	1000	ND	620	810	81
1800	1800	ND	1800	1800	100
3200	3400	ND	3400	3400	106
5600	5800	ND	6300	6100	109
10000	10000	ND	ND**	10000	100

ND = Not determined (see section 4.1)

* Mean of triplicate injections: 62, 66, 73 µg/l

** Terminated at 48 hours due to 100% mortality

*** These concentrations were very close to the limit of detection, therefore the data should be seen as qualitative rather than quantitative.

5

TABLE 2

PROXEL PRESS PASTE: ACUTE TOXICITY TO MYSID SHRIMP

PERCENT MORTALITIES

Sponsor:	ZENECA Biocides
Test substance:	Proxel press paste
Test organism:	Mysid shrimp (<i>Mysidopsis bahia</i>)
Test water:	20‰ salinity sea water

Nominal concn. of Proxel press paste (µg/l)	Mean measured concn. of Proxel press paste (µg/l)	% mortality			
		24 h	48 h	72 h	96 h
Dilution water control	<36	0	0	0	0
32*	<38	0	0	0	0
56*	59	0	0	0	0
100	95	0	0	0	0
180	180	0	0	0	0
320	330	0	0	0	0
560	410	0	10	10	10
1000	810	0	20	20	20
1800	1800	0	30	30	40
3200	3400	0	90	100	100
5600	6100	0	90	100	100
10000	10000	10	100	100	100

* Since the chemical analysis was very close to the limit of detection (Table 1), and there were no mortalities, these treatments were not used to calculate the LC50 values.

Ecological Effects Branch One-Linear Data Entry Form

Chemical Prochloraz (Benzothiazolines) Shaughnessy No. 098901 Pesticide Use Unknown

INVERTEBRATE ACUTE TOXICITY	% AI	EC ₅₀ (95%CL) SLOPE	HRS/TYPE	NOEC	STUDY/REVIEW DATES	MRID/CATEGORY	LAB	RC
1. <i>Ayscia</i>	76.1	1300 µg/l [*] (900-1800) 4/8	96 hr SPATIC	330 µg/l [*]	1993/1993	429490-02 Core	ZEN [*]	MM
2.								
3.								
4.								
5.								
6.								
7.								
CHRONIC TOX.	% AI	MATC LC ₅₀	DAYS	AFFECTED PARA.	STUDY/REVIEW DATES	MRID/CATEGORY	LAB	RC
1.								
2.								
3.								

COMMENTS: * based on new measured concentrations of prochloraz ZEN = ZENECA INC.

7

MOSSLER PROXEL PRESS PASTE MYSIDOPSIS BAHIA 12-6-93

CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB. (PERCENT)
3400	10	10	100	9.765625E-02
1800	10	4	40	37.69531
810	10	2	20	5.46875
410	10	1	10	1.074219
330	10	0	0	9.765625E-02

THE BINOMIAL TEST SHOWS THAT 410 AND 3400 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 1951.175

RESULTS CALCULATED USING THE MOVING AVERAGE METHOD

SPAN	G	LC50	95 PERCENT CONFIDENCE LIMITS	
3	.167754	1440.199	1037.181	2153.563

RESULTS CALCULATED USING THE PROBIT METHOD

ITERATIONS	G	H	GOODNESS OF FIT PROBABILITY
4	.2007587	1	.2044305

SLOPE = 3.236959
95 PERCENT CONFIDENCE LIMITS = 1.786604 AND 4.687315

LC50 = 1480.512
95 PERCENT CONFIDENCE LIMITS = 1050.397 AND 2238.631

LC10 = 599.8855
95 PERCENT CONFIDENCE LIMITS = 281.1968 AND 872.0394
