4-8-82

Duplicate

DATA EVALUATION

1. CHEMICAL: WL 43467

2. FORMULATION: 84.6 % active ingredient (Referred to as "technical.")

3. CITATION: Stephenson, R.R. (1980) the acute toxicity of WL 43467 to some freshwater invertebrates in static water tests. Unpublished report by Shell Toxicology Laboratory, Tunstall, submitted 12/28/81 by ICI Americas Inc.

   EPA Accession No. 070562

4. REVIEWED BY: Thomas B. Johnston
   Biologist, EEB/HED

5. REVIEW DATE: April 8, 1982

6. TEST TYPE: 1, 2, 4, 9, 20, and 24-hr EC50 and LC50

7. REPORTED RESULTS: The 24-hr LC_{50}s of cypermethrin were <0.1 ppm for a wide variety of aquatic invertebrates.

8. REVIEWER'S CONCLUSIONS: This study is scientifically sound, but does not fulfill USEPA guideline requirements for an acute toxicity test using an aquatic invertebrate. With 24-hr LC_{50}s of <0.1 ppm, cypermethrin is my highly toxic to a wide range of freshwater aquatic invertebrates.

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MATERIALS/METHODS

Methods used generally followed USEPA guidelines. Tests were run at 15°C. The LC_{50} death criterion was no visible response to tactile stimulation. The EC_{50} criterion was inability to respond to tactile stimulation by normal escape movements. The following species were used: Daphnia magna, Gyrinus natator, Notonecta spp., Chironomus thummi, Gammarus pulex, Chaoborus spp., Aedes aegypti, Asellus spp., Piona carnea, Corixa punctata, Lymnea peregra, and Cleon dipterum.

STATISTICAL ANALYSES

Data were analyzed according to the probit method of Holmes (1969). If the data collected were insufficient for probit analysis, the LC_{50}s and EC_{50}s were estimated by graphical interpretation on log-probit graph paper.

RESULTS

Test organisms	Size	EC_{50} ugl^{-1} (95% conf. limits)			LC_{50} ugl^{-1} (95% conf. limits)	
		2h	24h	24h+ 24h recovery	24h	24h+ 24h recovery
Daphnia magna	<24 h old	>5	2(1-3)	No data	2(1-5)	No data
Asellus spp.	3-8 mm	.03	.02(-)	.07(.05-.1)	.2(.1-.4)	.7(.5-1.3)
Gammarus pulex	3-8 mm	.08(.06-.1)	.04(.02-.06)	.01	.1(.08-.2)	.1(.07-.2)
Cloeon dipterum	larvae	.07(.04-.1)	.07(.04-.2)	.06(.01-.2)	.6(.3-1)	.5(.3-.7)
Gyrinus natator	adults	.2	.07(.04-.2)	.06(-)	>5	>5
Chironomus thummi	larvae	.1(.07-.2)	.2(.1-.3)	3(-)	>5	>5
Aedes aegypti	larvae	.05(.01-.09)	.03(-)	.6(.4-1)	1(.4-4)	1(.8-2)
Chaoborus spp.	larvae	.09(.02-.2)	.03(-)	No data	.2(.03-/4)	No data
Corixa punctata	adults	.3(.1-.6)	.7(.4-2)	.9(-)	>5	>5

Notonecta spp.	adults	.3(.1-.6)	.3(.2-.6)	.6(-)	>5	>5
Piona carnea	adults	.02	.02	.01(-)	.05(.03-.08)	.07(-)
Lymnea peregra*	<8 mm	>5	>5	>5	>5	>5

*Data obtained from a preliminary test.
NB. 10 organisms were exposed at each dilution except for Chaoborus where only 5 were used. All organisms were held at 15° ± 1°C except for Daphnia and Aedes which were 18 ± 1°C.
EC_{50} and LC_{50} values without parentheses are best estimates from graphical interpolations.

CONCLUSIONS:

Validation Category: Supplemental

Category Rationale: The study was scientifically sound, but was not run according to EPA guidelines. The toxicity tests were run for only 24 hours, rather than the recommended 48. The test temperature differed from those recommended for use. The loss of substantial amounts of the test substance from the test vessels raises questions about whether the stock solution was prepared properly. Other studies have not reported such losses. The test material was listed as 84.6% active ingredient, but the cis: trans ratio was not given. More recent tests have referred to a technical grade material of 87.8%.

Some information from this study can be used in making a hazard assessment. For example, it is worth noting that sublethal effects were noticed at lower concentrations than those that caused mortalities.

Category Repairability: This study cannot be repaired to Core.