

Deltamethrin

Toxicity Data Summary

Hyalella azteca

Picard CR. 2010d. 10-Day toxicity test exposing freshwater amphipods (*Hyalella azteca*) to deltamethrin applied to formulated sediment under static-renewal conditions. Springborn Smithers Laboratories Study No. 136565.6136, Wareham, MA. Submitted by pyrethroid working group. DPR record number 254434.

	Picard 2010	<i>H. azteca</i>
Parameter	Value	Comment
Test method cited	Springborn Smithers Laboratories Protocol No.: 100808/OPPTS/10-day <i>Hyalella</i> /artificial sediment.	USEPA
Phylum	Not stated	
Class	Not stated	
Order	Not stated	
Family	Not stated	
Genus	<i>Hyalella</i>	
Species	<i>azteca</i>	
Family in North America?	yes	
Age/size at start of test/growth phase	8 to 9 days old	
Source of organisms	Springborn Smithers lab culture	
Have organisms been exposed to contaminants?	No	
Animals acclimated and disease-free?	Yes	
Animals randomized?	Yes	
Test vessels randomized?	Not stated	
Test duration	10 day	
Data for multiple times?	No	10 day only
Effect 1	Mortality	
Control response 1	98% neg control/95% solvent control survival	Pooled control
Effect 2	Growth	
Control response 2	0.12 mg	Pooled control
Effect 3	Not stated	
Control response 3	Not stated	
Temperature	22 to 25 °C	
Test type	Static renewal	
Photoperiod/light intensity	16 h/8 h dark; 520-730 lux	
Dilution water (overlying water)	Well water	
pH	6.9	
Hardness	60-72 mg/L	
Alkalinity	20 to 23 mg/L	
Conductivity	380-460 µmhos/cm	

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Parameter	Value	Comment
Dissolved Oxygen	3.4 – 8.4 mg/L	
TOC/DOC	0.54 mg/L/Not stated	
Ammonia-N	<0.01 – 0.39 mg/L	
Chemical analysis?/ Method	No	
Sediment formulated?	Yes	Method: OECD 218
Organic carbon	2.4%	
Particle size distribution (sand, silt, clay)	84%, 1%, 15%	
pH	6.8	
Percent solids	60.02%	
Sediment spike procedure	Jar rolling technique	4 h @ RT; 15 rpm
Sediment spike equilibration time	14 d @ 4°C	Mixed 2x/week for 2 h @ RT
Sediment to Solution ratio	100:175 mL	100 mL sediment = 137 g wet wt or 82.5 g dry wt
Pore Water monitored?	Yes	Results in supplemental report; not referenced
Pore water extraction method	Centrifugation	1200 <i>g</i> 15-30 min
Pore water chemical extraction	SPME	
Pore water chemical analysis	Not stated	
pH	6.8-7.0	
TOC	80-150 mg C/L	
DOC	80-110 mg C/L	
Ammonia-N	1.4-2.8 mg/L	
Redox	170-240 mV	
Feeding	1 mL of YCT daily	Per replicate vessel
Purity of test substance	99.80%	
Concentrations measured?	Yes	
Measured is what % of nominal?	88-120% in sediment spikes	84-130% in stock solutions
Toxicity values calculated based on nominal or measured concentrations?	Measured	
Chemical method documented?	Yes	Ext/cleanup and instrument analysis
Concentration of carrier (if any) in test solutions	0%	10 mL of acetone evaporated from sand
Concentration 1 Nom/Meas (µg/kg)	0.25/0.28	8 Reps and 10 per
Concentration 2 Nom/Meas (µg/kg)	0.5/0.59	8 Reps and 10 per
Concentration 3 Nom/Meas (µg/kg)	1.0/1.0	8 Reps and 10 per
Concentration 4 Nom/Meas (µg/kg)	2.0/2.3	8 Reps and 10 per
Concentration 5 Nom/Meas (µg/kg)	4.0/4.3	8 Reps and 10 per
Concentration 6 Nom/Meas (µg/kg)	8.0/7.4	8 Reps and 10 per

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Control	Solvent and negative controls	8 Reps and 10 per
LC50 (µg/kg)	3.8 (3.4-4.3)95%CI	Method: Spontaneous Logit analysis using TOXSTAT
EC50 (µg/kg)	1.7 (1.5 – 1.9) 95% CI	Method: Linear interpretation method;
NOEC(µg/kg)	Survival: 1.0 Growth: 0.28	Survival: Wilcoxon's rank sum test with Bonferroni Adjustment; Growth: Bonferroni's t-Test; TOXSTAT program p: 0.05 MSD:
LOEC(µg/kg)	Survival: 2.3 Growth: 0.59	Same as above
MATC (GeoMean NOEC,LOEC)	Survival: 1.5; growth: 0.41	
% of control at NOEC	(99%/96%=103%); (0.12/0.12=100%)	Pooled controls
% of control at LOEC	(80/96=83%);(0.09/0.12=75%)	Pooled controls

Notes:

Protocol adapted from: USEPA, 2000. Methods for measuring the toxicity and bioaccumulation of sediment-associated contaminants with freshwater invertebrates. Protocol fulfills requirement of USEPA OPPTS 850.1735 Whole sediment acute toxicity invertebrates, freshwater (USEPA, 1996).

Although the study states pore water results are in a supplemental report, the data was never made available due to analytical and sample holding time issues.