Bifenthrin

Toxicity Data Summary

Hyalella azteca

Picard CR. 2010a. 10-Day toxicity test exposing freshwater amphipods (*Hyalella azteca*) to bifenthrin applied to formulated sediment under static-renewal conditions. Springborn Smithers Laboratories Study No. 136565.6133, Wareham, MA. Submitted to pyrethroid working group. DPR record number 254431.

	Picard 2010	***H. azteca***
Parameter	**Value**	**Comment**
Test method cited	Springborn Smithers Laboratories Protocol No.: 100808/OPPTS/10-day Hyalella/artificial sediment.	USEPA
Phylum	Not stated	
Class	Not stated	
Order	Not stated	
Family	Not stated	
Genus	*Hyalella*	
Species	*azteca*	
Family in North America?	yes	
Age/size at start of test/growth phase	7 day 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/93% solvent control survival	Pooled control
Effect 2	Growth	
Control response 2	0.11 mg	Pooled control
Effect 3	Not stated	
Control response 3	Not stated	
Temperature	21 to 25 ℃	
Test type	Static renewal	
Photoperiod/light intensity	16 h/8 h dark; 500-910 lux	
Dilution water (overlying water)	Well water	
pH	6.4-7.1	
Hardness	66-70 mg/L	
Alkalinity	22 mg/L	
Conductivity	420-430 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 – 0.30 mg/L	
Chemical analysis?/ Method	No	
Sediment formulated?	Yes	Method: OECD 218
Organic carbon	2.1%	
Particle size distribution (sand, silt, clay)	71%, 7%, 22%	
pH	7.1	
Percent solids	63.50%	
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 = 141 g wet wt or 89.6 g dry wt
Pore Water monitored?	Yes	Results in supplemental report; not referenced
Pore water extraction method	Centrifugation	1200 *g* 15-30 min
Pore water chemical extraction	SPME	
Pore water chemical analysis	Not stated	
pH	6.7-7.0	
TOC	130-180 mg C/L	
DOC	98-140 mg C/L	
Ammonia-N	1.4-5.1 mg/L	
Redox	160-180 mV	
Feeding	1 mL of YCT daily	Per replicate vessel
Purity of test substance	95.7%	
Concentrations measured?	Yes	
Measured is what % of nominal?	93-110% in sediment spikes	97-130% 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)	0.25/0.25	Reps and # per (cell density for single-celled organisms):
Concentration 2 Nom/Meas (µg/kg)	0.5/0.45	8 Reps and 10 per
Concentration 3 Nom/Meas (µg/kg)	1.0/0.92	8 Reps and 10 per

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Parameter	**Value**	**Comment**
Concentration 4 Nom/Meas (µg/kg)	2.0/1.9	8 Reps and 10 per
Concentration 5 Nom/Meas (µg/kg)	4.0/3.6	8 Reps and 10 per
Concentration 6 Nom/Meas (µg/kg)	8.0/7.7	8 Reps and 10 per
Control	Solvent and negative controls	8 Reps and 10 per
LC50	3.7 (3.3-4.1)95%CI	Method: Spotaneous Logit analysis using TOXSTAT
EC50	> 7.7	Method: Linear interpretation method; empirically estimated
NOEC	Survival: 1.9 Growth: 0.45	Method: Bonferroni's t-Test; TOXSTAT program p: 0.05 MSD:
LOEC	Survival: 3.6 Growth: 0.92	Same as above
MATC (GeoMean NOEC,LOEC)	Survival: 2.6; growth: 0.64	
% of control at NOEC	(88%/95%=93%); (0.1/0.11=91%)	Pooled controls
% of control at LOEC	(50/95=53%);(0.09/0.11=82%)	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.