Technical Information | **Stepan**

Stepan Company
Northfield, Illinois 60093
Telephone 847 446 7500

ECOTOXICOLOGY OF DIAMIDOAMINE QUATERNARIES

Applicable to these current Stepan products:

ACCOSOFT® 460 HC	ACCOSOFT® 501	ACCOSOFT® 501 DEG
ACCOSOFT® 550-75	ACCOSOFT® 550-90 HF	ACCOSOFT® 550-90 HHV
ACCOSOFT® 550-PG	ACCOSOFT® 580	ACCOSOFT® 620-75
ACCOSOFT® 780	ACCOSOFT® 780 PG	

Applicable to these inactive Stepan products:

ACCOSOFT® 440-75%	ACCOSOFT® 502	ACCOSOFT® 540
ACCOSOFT® 540 HC	ACCOSOFT® 550 HFC	ACCOSOFT® 550L-90
ACCOSOFT® 570	ACCOSOFT® 570 HC	ACCOSOFT® 750
ACCOSOFT® 620-90%		

Toxicological Information:

Test/Conditions	Results/Classification	References
Aquatic Toxicology:		
Acute Toxicity (blue gill) 96 hr. i.) laboratory water ii.) surface water	LC_{50} = 0.62 – 1.2 mg/l (highly to moderately toxic) LC_{50} 4.6 to 30 mg/l (moderately to slightly toxic)	Industry Consortium Data
Acute Toxicity (D. magna) 48 hr. i.) laboratory water ii.) surface water	EC_{50} = 0.3 mg/l (highly toxic) EC_{50} 4.5 mg/l (slightly toxic)	Industry Consortium Data
Acute Toxicity (sheepshead minnow) 48 hr. (marine)	LD_{50} = 20 mg/l (slightly toxic)	Industry Consortium Data
Acute Toxicity	C_{50} = 28 mg/l	Industry

(Mysid shrimp) (48 hr) (marine)	(slightly toxic)	Consortium Data
Acute Toxicity (alga Selenastrum) i.) laboratory water ii.) surface water	EC_{50} 1.33 mg/l (moderately toxic) EC_{50} 12.5 mg/l (slightly toxic)	Industry Consortium Data
Discussion: It should be noted that a number of the above studies reflect toxicity of diamidoamine quaternaries in both laboratory and surface water. High acute aquatic toxicity (fish and daphnia) were observed in studies conducted in laboratory water using test methods that do not consider the physical and chemical properties of these molecules, thus, representing an unrealistic scenario. The higher LC_{50} values (lower toxicity) observed in surface water relative to laboratory water can be explained on the basis of chemical and physical properties of these molecules. It is know that quaternaries adsorb to suspended solids and organic anions. It is believed that these properties are responsible for substantially reducing bioavailability and subsequent toxicity of diamidoamine quats to aquatic organisms in natural surface waters.		

References:

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