



ECOTOXICOLOGY OF DIAMIDOAMINE QUATERNARIES

Applicable to these current Stepan products:

ACCOSOFT® 440-75	ACCOSOFT® 460 HC	ACCOSOFT® 501
ACCOSOFT® 501 DEG	ACCOSOFT® 540	ACCOSOFT® 550-75
ACCOSOFT® 550-90 HF	ACCOSOFT® 550-90 HHV	ACCOSOFT® 550-PG
ACCOSOFT® 550 HFC	ACCOSOFT® 550L-90	ACCOSOFT® 580
ACCOSOFT® 620-75	ACCOSOFT® 620-90	ACCOSOFT® 750
ACCOSOFT® 780	ACCOSOFT® 780 PG	

Applicable to these inactive Stepan products:

ACCOSOFT® 502	ACCOSOFT® 540 HC	ACCOSOFT® 570
ACCOSOFT® 570 HC		

Toxicological Information:

<u>Test/Conditions</u>	<u>Results/Classification</u>	<u>References</u>
Aquatic Toxicology:		
i.) Acute Toxicity (blue gill) 96 hr. laboratory water	LC ₅₀ = 0.62 – 1.2 mg/l (highly to moderately toxic)	Industry Consortium Data
ii.) surface water	LC ₅₀ 4.6 to 30 mg/l (moderately to slightly toxic)	
i.) Acute Toxicity (D. magna) 48 hr. laboratory water	EC ₅₀ = 0.3 mg/l (highly toxic)	Industry Consortium Data
ii.) surface water	EC ₅₀ 4.5 mg/l (slightly toxic)	
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	EC ₅₀ 1.33 mg/l (moderately toxic)	Industry Consortium Data
ii.) surface water	EC ₅₀ 12.5 mg/l (slightly toxic)	
<p>Discussion:</p> <p>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 LC₅₀ 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 known 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.</p>		

References:

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