



ECOTOXICOLOGY OF DIAMIDOAMINE QUATERNARIES

Applicable to these current Stepan products:

ACCOSOFT® 460 HC ACCOSOFT® 550-75 ACCOSOFT® 550-PG ACCOSOFT® 780	ACCOSOFT® 501 ACCOSOFT® 550-90 HF ACCOSOFT® 580 ACCOSOFT® 780 PG	ACCOSOFT® 501 DEG ACCOSOFT® 550-90 HHV ACCOSOFT® 620-75
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Applicable to these inactive Stepan products:

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

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 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.

References:

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Last Update: [November 9, 2023](#)

Revision Reference: [TX042-04](#)

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