Technical Information

Stepan

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ECOTOXICOLOGY OF LINEAR ALKYLBENZENE SULFONATES (LAS)

Applicable to these current Stepan products:

BIO-SOFT® D-40	BIO-SOFT® N-300	BIO-SOFT® N-411
BIO-SOFT® S-101	BIO-SOFT® S-101 LS	BIO-SOFT® S-111 H
BIO-SOFT® S-118	BIO-SOFT® S-120	NACCONOL® 40G
NACCONOL® 90G	POLYSTEP® A-15-30K	POLYSTEP® LAS-50
STEPWET® DF-90	STEPANTAN® DT-60	BIO-SOFT® D-62 LT
BIO-SOFT® L2P-123		

Applicable to these inactive Stepan products:

BIO-SOFT® D-53	BIO-SOFT® S-100	BIO-SOFT® S-130
POLYSTEP® A-4	POLYSTEP® A-7	STEPANTAN® DS-40
POLYSTEP® A-15K		

Toxicological Information:

Test/Conditions	Results/Classification	References
Acute Aquatic Toxicity (fathead minnow) (96 hr.)	LC_{50} (Lethal Concentration) =6 mg/l (moderately toxic)	EHSMS*
Acute Aquatic Toxicity (bluegill sunfish) (96 hr.)	LC_{50} =1.18 – 6.5 mg/l (moderately toxic)	EHSMS
Acute Aquatic Toxicity (daphnia) (24 hr.)	LC_{50} =6.9 mg/l (moderately toxic)	EHSMS
Acute Aquatic Toxicity (clam) (96 hr.)	LC_{50} =7.0 mg/l (slightly toxic)	EHSMS
Acute Aquatic Toxicity (shore crab) (96 hr.)	LC_{50} > 100 mg/l (practically non-toxic)	EHSMS
Acute Aquatic Toxicity (green algae)	LC_{50} =50-100 mg/l (slightly to practically non-toxic)	EHSMS
Acute Aquatic Toxicity (S. African clawed frog)	LC_{50} =5.6-10 mg/l (moderately toxic)	EHSMS

Test/Conditions	Results/Classification	References
Subchronic Aquatic Toxicity (fathead minnow) (continuous flow) (5 weeks)	Five-week growth, egg production and hatchability was not affected at concentrations up to 2.7 mg/l	EHSMS
Chronic Aquatic Toxicity (fathead minnow) (1 year)	No observed effective concentration (NOEC) = 0.9 mg/l	EHSMS
Developmental Aquatic Toxicity (bluegill) (5 day)	Feeding sac-fry was the most sensitive and egg fertilization was the least sensitive stage	EHSMS
Growth Reduction Study (plant: sorghum sunflower, mung bean) (21 day)	No growth reduction over 21 days at 100 mg/kg soil	EHSMS

Discussion:
There appears to be little variation in the acute aquatic toxicity of LAS. The LC_{50} values for fish generally fall below 10mg/l. The egg and fry stage of development are usually more sensitive to LAS than the adult stage. LAS toxicity testing in invertebrates produced results similar to those found in fish. Chronic fish studies indicate relative insensitivity to long term LAS exposure. Plant toxicity studies have been conducted in a wide range of media and conditions. At high concentrations (1000 mg/kg soil), LAS inhibits plant growth while at lower concentrations there were no effects. It should be noted that ready biodegradability of LAS reduces its toxicity from 10 to 100 fold.

References:

*Environmental and Human Safety of Major Surfactants (EHSMS), Vol. 1, Anionic Surfactants, Part 1, Linear Alkylbenzene Sulfonates. Final Report to: Soap and Detergent Association, Feb. 1991.

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