



ECOTOXICOLOGY OF ALPHA SULFO METHYL ESTERS (SMES)

Applicable to these current Stepan products:

ALPHA-STEP® BSS-45 ALPHA-STEP® PS-85P	ALPHA-STEP® MC-48	ALPHA-STEP® PC-48
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Applicable to these inactive Stepan products:

ALPHA-STEP® BSN-15	ALPHA-STEP® ML-40	
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Toxicological Information:

<u>Test/Conditions</u>	<u>Results/Classification</u>	<u>References</u>
<u>Aquatic Toxicology</u>		
Acute Aquatic Toxicity (Rainbow trout) (96 hr.) a. Liquid (36.34% active)	LC ₅₀ = 1.7 mg A.I./L (moderately toxic) NOEC ¹ =1.3 A.I./L	Stepan Study No. 93-005A
b. Neat material (waxy solid)	LC ₅₀ = 1.7 mg A.I./L (moderately toxic) NOEC =1.0 A.I./L	Stepan Study No. 94-006G
Acute Aquatic Toxicity (D. magna) (48 hr.) a. Liquid (36.34% active)	EC ₅₀ = 4.3 mg A.I./L (moderately toxic) NOEC = 1.6 mg A.I./L	Stepan Study No. 93-005B
b. Neat material (waxy solid)	EC ₅₀ = 2.5 mg A.I./L (moderately toxic) NOEC = 1.0 mg A.I./L	Stepan Study No.94-006H
Acute Toxicity to Freshwater Algae (72 hr.) a. Liquid (36.34% active)	EC ₅₀ = 0.71 mg A.I./L (highly toxic)	Stepan Study No. 93-005C
b. Neat material (waxy solid)	EC ₅₀ = 45 mg/L (slightly toxic) NOEC = 15 mg/L	Stepan Study No. 94-006I
Chronic Aquatic Toxicity (Reproduction) (D. Magna) (21 day) neat material (waxy solid)	EC ₅₀ range 0.25-0.80 mg/l NOEC=0.25 mg/l (estimated values based on nominal test concentrations)	Stepan Study No. 94-006N

References:

NOEC = No Observed Effect Concentration

1. HPV challenge program submission for Fatty Acid, C12-18 Me Esters, Sulfonated, Na Salts. Nov. 2008.
2. Gode, von P., Guhl, W., and Steber, J., Oekologische Bewertung von -Sulfofettsaeremethylester. Fat Sci. Technol., 1987, 89: 548-552.
3. OECD SIDS Hexadecanoic Acid, 2-Safo, 1-Methylester, Sodium Salt, 2003.
4. Masuda, M., Environmental Aspects of Detergent Materials-Biodegradation of Detergent Surfactants. Oils-Fats-Lipids, 1995, 3:649-653.

5. Steber, J., and Wierich, P., The Environmental Fate of Fatty Acid Sulfomethyl Esters. *Tenside Surf. Det.*, 1989, 46: 406-411.
6. European Directive 67/548/EEC, Annex VI, 5.2.1.3.

ALPHA-STEP® is a registered trademark of Stepan Company.

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