



ECOTOXICOLOGY OF ALCOHOL ETHOXYLATES

Applicable to these current Stepan products:

BIO-SOFT® AE-3	BIO-SOFT® E-670	BIO-SOFT® E-678
BIO-SOFT® E-840	BIO-SOFT® E-847	BIO-SOFT® EC-600
BIO-SOFT® EC-639	BIO-SOFT® EC-690	BIO-SOFT® EN-600
BIO-SOFT® EN-695	BIO-SOFT® EN8-90	BIO-SOFT® ET-650
BIO-SOFT® FF-400	BIO-SOFT® FF-600	BIO-SOFT® GSB-9
BIO-SOFT® N-1200	BIO-SOFT® N-400	BIO-SOFT® N-600
BIO-SOFT® N-900	BIO-SOFT® N-901	BIO-SOFT® N-905
BIO-SOFT® N1-3	BIO-SOFT® N1-5	BIO-SOFT® N1-7
BIO-SOFT® N1-73B	BIO-SOFT® N1-9	BIO-SOFT® N23-3
BIO-SOFT® N23-5	BIO-SOFT® N23-6.5	BIO-SOFT® N25-12
BIO-SOFT® N25-3	BIO-SOFT® N25-7	BIO-SOFT® N25-9
BIO-SOFT® N45-7	BIO-SOFT® N91-2.5	BIO-SOFT® N91-6
BIO-SOFT® N91-8	BIO-SOFT® TD-630	MAKON® 30
MAKON® 50	MAKON® DA-6	MAKON® NF-12
MAKON® TD-12	MAKON® TD-18	MAKON® TD-3
MAKON® TD-30	MAKON® TD-50	MAKON® TD-6
MAKON® TD-8	MAKON® TD-9	PETROSTEP® FRB-5
POLYSTEP® TD-129	POLYSTEP® TD-189	POLYSTEP® TD-3
POLYSTEP® TD-507	POLYSTEP® TD-6	STEPANTEX® DA-6
STEPANTEX® TD-560	STEPANTEX® TD-630	

Applicable to these inactive Stepan products:

BIO-SOFT® AE-1	BIO-SOFT® AE-2	BIO-SOFT® EA-10
BIO-SOFT® EA-8	POLYSTEP® AE-120	

Toxicological Information:

<u>Test/Conditions</u>	<u>Results/Classification</u>	<u>References*</u>
Acute Aquatic Toxicity to Fish (96 hr.)	LC50 \leq 1 to \geq 10 mg/l	HERA & EHSMS
Acute Aquatic Toxicity to Invertebrates (D. magna) (48 hr.)	EC50 \leq 1 to \geq 10 mg/l	HERA & EHSMS
Acute Aquatic Toxicity	ErC50 \leq 1 to \geq 10 mg/l	HERA & EHSMS

(alga) (96 hr.)		
Chronic Aquatic Toxicity to Fish	NOEC \geq 0.1 - 10 mg/L	HERA & EHSMS
Chronic Aquatic Toxicity to Invertebrates (D. magna)	ErC10 (NOEC) \leq 0.1 to 10 mg/L	HERA & EHSMS
Chronic Aquatic Toxicity (alga) (72-hour survival/growth)	ErC10 (NOEC) \leq 0.1 to 10 mg/L	HERA & EHSMS
<p>Discussion: Toxicity of Alcohol Ethoxylates (AE) generally decreases with increasing ethylene oxide (EO) and decreasing chain length (decreasing liposolubility). Branched alkyl chains are less toxic than linear alkyl chains; secondary attachment of the alcohols reduces toxicity compared to primary alcohols. Surfactants containing EO/PO (propylene oxide) block copolymers are less toxic than those containing only EO.</p>		

LC50 = lethal concentration to 50% of organisms

EC50 = effective concentration to 50% of organisms

ErC50 = effective concentration (growth rate) to 50% of organisms

NOEC = No Observed Effect Concentration

References:

*Human and Environmental Risk Assessment (HERA) on ingredients of European household cleaning products, 2009.

*Talmage, S.S., "Environmental and Human Safety of Major Surfactants (EHSMS)" 1994.

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