Technical Information | **Stepan**

Stepan Company

Northfield, Illinois 60093
Telephone 847 446 7500

BIODEGRADATION OF ALKYL ETHER SULFATES

Applicable to these current Stepan products:

ALPHA FOAMER®	CEDEPAL® FA-403	CEDEPAL® FA-406
CEDEPAL® TD-403 MFLD	CEDEPAL® TD-403 MKLD	CEDEPAL® TD-407
POLYSTEP® B-11	POLYSTEP® B-12	STEOL® 4N
STEOL® CA-230	STEOL® CA-330	STEOL® CS-130
STEOL® CS-130 DMDM K	STEOL® CS-130 HP	STEOL® CS-170
STEOL® CS-170 UB	STEOL® CS-230	STEOL® CS-230-KE
STEOL® CS-230 PC HP	STEOL® CS-230 PCK	STEOL® CS-270
STEOL® CS-270 C	STEOL® CS-270 SU	STEOL® CS-330
STEOL® CS-360	STEOL® CS-370	STEOL® CS-460
STEOL® FA-403	STEOL® FS-406	STEOL® OS-270
STEOL® OS-330	STEOL® TD-403-65	STEPOSOL® CA-207
STEPOSOL® CA-406H	STEOL® CA-370 STEOL® CA-460	STEOL® 23-2S.70 CP
STEOL® CS-230-K	STEOL® OS-230 2.0	STEOL® TD-403 MFLD
STEOL® CS-270 LDX	STEOL® CS-370E	STEOL® CS-270 LDX HP
STEOL® DES-32IS	STEOL® CS-370 L6 CP	STEOL® 25-3S/70 FC
STEOL® 25-3S.70 CP		

Applicable to these inactive Stepan products:

CEDEPAL® TD-403	CEDEPAL® TDS-484LD	PETROSTEP® ES-65A
POLYSTEP® B-20	POLYSTEP® B-22	STEOL® CA-130
STEOL® CA-230-D	STEOL® CA-230-K	STEOL® CA-370-E
STEOL® CS-230-E	STEOL® CS-230 PCF	STEOL® TD-403-70
STEPOSOL® CA-319	STEOL CA-370-25	STEOL CA-360
STEOL CS-270-2.2	STEOL OS-170	

Biodegradation Information:

Alkyl ether sulfates (AES) are frequently used in liquid detergent products such as dishwashing, hair shampoo, bubble bath and shower/bath type products. It has been reported that over 500 million pounds of AES are produced and used annually in the United States.

Numerous laboratory studies have shown that the linear forms of AES, found in the Stepan surfactants identified above, biodegrade quite readily under both aerobic and anaerobic conditions. Primary biodegradation of C12 ether sulfates in river die-away studies has been found to reach 90- 100% within 1 to 5 days. The biodegradation of AES surfactants using Sturm CO2 evolution method (OECD 301B) as well as the Closed Bottle test (OECD 301D) show Alcohol Ethoxy Sulfates to be readily biodegradable (>60 or 70% biodegradation in 28 days). Therefore, the Stepan AES products identified above would also be considered as readily biodegradable by OECD standard methods such as 301B and 301D.

Field studies have shown that removal of AES compounds during routine sewage treatment processes is extensive. AES removal rates of 98-100% have been reported.

References:

*Environmental Risk Assesment of Alcohol Ethoxysulfates (AES), HERA June 15, 2004

* Arthur D. Little, Inc., "Environmental and Human Safety of Major Surfactants, Volume 1. Anionic Surfactants, Part 2. Alcohol Ethoxy Sulfates, Final Report to the Soap and Detergent Association, February, 1991.

* Painter, H.A., "Alkyl Ether Sulfates", The Handbook of Environmental Chemistry, Vol. 3, Part F: Anthropogenic Compounds, 1992, pp. 58-68.

Last Update: 3.23.12 Revision reference: BI008.26