Technical Information

Stepan

Stepan Company
22 West Frontage Road
Northfield, Illinois 60093
Telephone (847) 446-7500

Customer Service: 1-800-457-7673
Technical Service: 1-800-745-7837

www.stepan.com

BIODEGRADATION OF ALPHA OLEFIN SULFONATES (AOS)

Applicable to these current Stepan products:

BIO-TERGE® AS-40	BIO-TERGE® AS-40 CG	BIO-TERGE® AS-40 CG-P
BIO-TERGE® AS-40 CG-PN	BIO-TERGE® AS-40 HA	BIO-TERGE® AS-40 LV
BIO-TERGE® AS-40A	BIO-TERGE® AS-40K	BIO-TERGE® AS-90 BEAD
POLYSTEP® A-18	POLYSTEP® A-18S	STEPANTAN® AS-12 46
STEPANTAN® AS-1216	POLYSTEP® A-18-LV	STEPANTAN® AS-12
STEPANTAN® AS18	BIO-TERGE® AS-40 CG-K	

Applicable to these inactive Stepan products:

STEPANTAN® 39N	STEPANTAN® AS-40	STEPANFLO® 30
1618 AOS	STEPANFLO® 70	

Biodegradation Information:

Alpha Olefin Sulfonate (AOS) surfactants have been commercially available in the United States since 1965. They have been formulated into a variety of detergents and shampoo products. AOS surfactants are often selected as replacements for linear alkylbenzene sulfonates, due to their biodegradation, foaming, detergency, and mildness properties.

The Stepan AOS products identified above are linear in structure, with carbon chain lengths ranging from C12 to C18. Published information on AOS surfactants shows that primary biodegradation of these compounds can reach 100% in 3 to 5 days under laboratory conditions. AOS surfactants have also been found to undergo extensive biodegradation when tested by strict European Organization for Economic Cooperation and Development (OECD) methods (301 B,C,D). Ultimate biodegradation of AOS in excess of 100% has been reported to occur within 30 days in Closed Bottle/BOD tests. OECD Modified Sturm (OECD 301 B) testing of one of Stepan's BIO-TERGE AS-40, showed this product to be "readily biodegradable".

Several studies have investigated the fate of AOS compounds under actual environmental conditions. In a one year sewage treatment plant study, performed by Sekiguchi, Oba, et al., the average level of AOS in the plant's incoming waste stream was determined to be approximately 2%. Methylene blue active/substances (MBAS) and Infrared Spectroscopy (IR) analyses of the water following activated sludge treatment showed that AOS had been completely removed. The findings of this study and the numerous laboratory studies which have been performed over the years show that AOS surfactants are environmentally compatible.

References:

*Alkyl Sulfonates and Alpha-Olefin Sulfonates: SIDS Initial Assessment Report, 2007

* Swisher, R.D., "Surfactant Biodegradation", Vol. 18, 2nd Edition, Marcel Dekker, Inc., 1987, pp 802.

* Arthur D. Little, Inc., "Environmental and Human Safety of Major Surfactants" Volume 1. Anionic Surfactants, Part 2. Alpha Olefin Sulfonates, August 1993.

* Schoberl, Marl & L. Huber, "Ecological Relevant Data Concerning Surfactants and Non-Surfactant Components of

Laundry and Cleaning Agents", Tenside Surfactant Detergents 25(188)2, 1988.

* Stepan Co. OECD Method 301B Modified Sturm Study of BIO-TERGE® AS-40 (Stepan Study No. 93-007).

Last Update: 1.19.12 Revision reference: BI004.08

Last Modified by: Barbara Gomez on 01/19/2012 12:35:07 PM