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Determination of Polyethoxylated (POE) Compounds and Cationic Surfactants in Mixture Respecting Principles of Green Analytical Chemistry

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Polyethoxylate nonionic surfactants (POE-NS) and polyethylene glycols (PEG) are neutral molecules that do not dissociate in water and from the analytical point of view not easy to determine. They are often present in detergent formulations that also contain cationic surfactants. The goal of this research is the development of analytical methods that will enable their quick and simple determination and at the same time in harmony with the principles of green analytical chemistry (GAC). For this purpose, we investigated potentiometric titrations, instrumental methods fast and simple to perform, in which sodium tetraphenylborate was used as a titrant, and a homemade cationic surfactant selective electrode (HTA-TPB sensor) as an indicator. The experimental part was performed in 3 phases: on two-component model mixtures (1), on laboratory samples of known composition (2), and on commercial products from the market (3). Two series of two-component samples containing cationic surfactants (BAC and DDAC) and fatty alcohol polyethoxylated (POE-NS) with 7 EO groups (often present in cleaning and disinfecting agents) and another containing cationic surfactants of the esterquat type and PEG 400 as a POE compound (common in softener formulations) were analyzed. The results obtained in the developed procedure agree with the expected results and can be applied in practice. .

Biography:

Dubravka Madunic-Cacic has a doctorate in Analytical Chemistry and since 1995 has been working in Saponia (QC-Method development), whose main products are detergents and cleaning agents in general. She is dedicated to developing sensors for surfactant analysis and the R&D of surfactant analytics. Home-made sensors are successfully used in surfactant analysis in real systems and wastewater samples in Saponia laboratories.

Maja Anicic has a doctorate in Chemical Engineering and since 2009 has been working in Saponia (R&D department of liquid detergent), whose main products are detergents and cleaning agents in general. She is dedicated to the development of formulations of liquid detergents, with emphasis on interactions between raw materials, especially fabric softeners.