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Effect of Polymer on Micellization Behavior of Dimeric and Monomeric Surfactants

Naveen Kumar[1]* and Rashmi Tyagi[2]

[1]Department of Chemistry, Shobhit University, Gangoh, Saharanpur, Uttar Pradesh 247341, India.
[2]Department of Chemistry, Jaypee University of Engineering & Technology, Guna, Madhya Pradesh 473226, India
E-mail: naveenharsana@gmail.com

Abstract

The purpose of this study is twofold: to explain the associations that occur between surfactants and polymer, and to discuss suitable methods for determining the degree of interactions, thermodynamic parameters for surfactants/polymer mixed system. The interaction between anionic dimeric and water-soluble polymer has been studied by surface tension and conductivity measurements. Carboxylate dimeric surfactant (CDS) and sodium dodecyl sulfate (SDS) were used as surfactants, while, polyacrylamide (PAAm) was used as a polymer for the present work. The investigated micellization parameters which include the critical micelle concentration (CMC), Gibbs free energy of micelle formation (ΔG^0_{mic}), standard entropy (ΔS^0_{mic}), standard enthalpy (ΔH^0_{mic}) and energy of transfer (ΔG^0_t) revealed that dimeric surfactant interacts in a highly cooperative manner with polymer as compared to monomeric surfactant.

Keywords: Insoluble monolayer; surface pressure; surface viscosity; surface potential