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Viscoelastic micellar solutions of dimeric surfactants in organic additives: ¹H-NMR, rheology, SANS and TEM characterization

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In the present study, we report the effect of organic additives and temperature on the micellization of cationic Gemini surfactants bis-dodecyl dimethyl ethylene diamine (12-2-12). The micellization behavior of Gemini surfactants were studied at different temperatures at 30°C and 50°C in different concentrations of organic additives (phenyl propionic acid) in aqueous solutions. The micellar environment of aqueous solution of Gemini-organic additives transform into spherical to vesicle micelles was investigated using nuclear magnetic resonance spectroscopy, rheology, scattering, infrared, microscopic, and also by dynamic light scattering. Changes in the structural parameters of the micelles with addition of additives were inferred from SANS measurements. The intensity of scattered neutrons at the low q region was found to increase with increasing PPA concentration. This suggests an increase in size of the micelles and/or decrease of intermicellar interactions with increasing salt concentration. Analysis of the SANS data using prolate ellipsoidal structure and Yukawa form of interaction potential between micelles indicates that addition of additives leads to a decrease in the surface charge of the ellipsoidal micelles and consequently an increase in their length. The Nagg were confirmed by the SANS and fluorescence measurement.

Biography

Bharatkumar Kanoje is pursuing his PhD from Applied Chemistry Department, Sardar Vallabhbhai National Institute of Technology, Surat, Gujarat-India. He has published four papers in reputed journals. He has completed his Master's degree in Industrial Chemistry specialization from South Gujarat University, Surat. He is also the Director of two different companies such as Alo Nature Agro Live and B cube Bio care.

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