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Micellar Behaviour of Mixed Surfactant System of Linear Alkyl Benzene Sulfonate and Triton X-100 in Pure and Hard Water

NAOREM HOMENDRA* and CH. INDIRA DEVI

Department of Chemistry, Manipur University, Canchipur, Manipur 795003.

Abstract The adsorption and the micellar behaviour of mixed surfactant system composed of Linear Alkyl Benzene Sulfonate-sodium salt (LABS) and Triton X-100 (TX100) over the entire composition range have been tensiometrically studied in 0, 20, 50, 100, 150, and 200 ppm (CaCO₃) hard water. From the study, the surface properties like maximum surface excess concentration, (G_{max}) and the minimum surface area per molecule (A_{min}) have been evaluated. The micellization in the mixed systems have been analyzed in the light of Rubinghs Regular Solution model. The composition of the mixed micelle (x) and the interaction parameter (b) of the mixed systems both in pure and hard water have been computed. For all the systems studied, b was found to be negative. The effect of addition of Ca²⁺ ions on the critical micelle concentration (cmc) of the surfactants was also analyzed in the light of the Corrin-Harkins equation. There was generally a deviation from the Corrin-Harkins behaviour indicating that the change in the cmc of the mixed systems cannot be explained on the basis of the counter ion binding effect only.

Keywords : Mixed surfactant systems, LABS, TX-100, mixed micelles, synergism, hard water.
