

Interfacial, Thermodynamic, and Performance Properties of α -Sulfonato Myristic Acid Methyl Ester—Hexaoxyethylene Monododecyl Ether Mixed Surfactants

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ABSTRACT

The interfacial, thermodynamic, and performance properties of the aqueous α -sulfonato myristic acid methyl ester (MES)—hexaoxyethylene monododecyl ether (C₁₂E₆) mixed surfactant system have been investigated. The critical micelle concentrations (cmcs) were obtained by surface tension and conductivity measurements. The maximum surface excess (Γ_{\max}) and minimum area per molecule (A_{\min}) were determined from surface tension (γ)–log concentration (log C) plots. The thermodynamic parameters of micellization and adsorption were computed. Micellar aggregation numbers (N_{agg}) of pure and mixed surfactant systems were evaluated by fluorescence measurements. Interaction parameters between surfactant molecules in mixed micelles were evaluated using Rubingh's approach. The performance properties of pure and mixed surfactant systems viz. foaming, detergency, and viscosity were studied. Cloud point (CP) determinations of the nonionic C₁₂E₆ in the presence of electrolytes (NaCl, NaBr, and NaI) and nonelectrolytes like polyethylene glycols (MW 200, 300, and 400) were also carried out.

Key Words: Micellization; Mixed surfactant; Interaction parameter; Foaming; Detergency.

INTRODUCTION

Surfactants are versatile compounds widely used in a variety of industrial and commercial applications.^[1] The

application potential of their surface wetting capabilities in areas like pharmaceutical industries

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