

Solubilization of Alkylpyridinium Ions in Cationic Micelles: Effect of the Electrostatic Repulsion

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Binding constants of n-alkylpyridinium, C_nPd^+ ($n = 10, 11, 12, 13, 14,$ and 16), to CTAX micelles, where $X = Br^-$ and Cl^- , and to CTAOTOS were determined by ultrafiltration and a steady-state fluorescence method. These micelles have different dissociation degrees and, consequently, different micellar surface potentials. Free energies of transfer, μ_t , were obtained from the distribution coefficients defined by the pseudophase model. From a plot of μ_t against the number of carbon atoms, a value of -2.5 kJ/mol was obtained for the incremental free energy per methylene group and $8.7, 11,$ and 13 kJ/mol for the electrostatic repulsion contribution sensed by C_nPd^+ in CTAOTOS, CTAB, and CTAC, respectively. C_nPdX , with $n = 10$, are solubilized mainly in the aqueous intermicellar phase. Based on these results, a site of solubilization of the pyridinium head group in the interface is proposed. © 1993, American Chemical Society. All rights reserved.