

Study of Aqueous Tetradecyltrimethylammonium Bromide-Brij 35 Solutions by Ion Activity Measurements

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Measurements of surfactant ion (tetradecyltrimethylammonium) and counterion (bromide) activities in binary tetradecyltrimethylaznmonium bromide (TTAB)-Brij 35 surfactant mixtures have been performed by using ion-specific electrodes. From the data obtained in the TTAB solutions in the absence of Brij 35, a TTAB critical micelle concentration (cmc) of $3.6 (\pm 0.2)$ mM was evaluated. The degree of counterion binding on TTAB micelles was calculated from the concentration dependence of bromide activity above the cmc, B_{th} , and by applying the charged phase separation model to the surfactant and counterion activity data obtained, β_{cps} . Values found were $\beta_{th} = 0.75$ and $\beta_{cps} = 0.8$. From the data obtained in the surfactant mixtures, the micellar composition and the counterion binding degree (β_{th}) of the mixed micelles have been evaluated. It was found that (1) in dilute solutions (total surfactant concentration lower than 5 mM) mixed micelles having a very low fraction of associated counterions are f