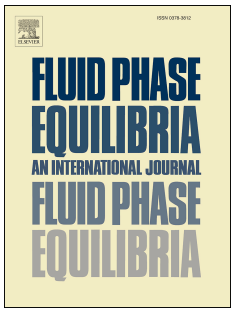
Accepted Manuscript



Investigation on the interfacial behavior of aqueous solutions of cetyltrimethyl ammonium bromide in presence of polyethylene glycols

Nayereh Sadat Mousavi, Shahin Khosharay

PII: S0378-3812(18)30098-0

DOI: 10.1016/j.fluid.2018.03.004

Reference: FLUID 11777

To appear in: *Fluid Phase Equilibria*

Received Date: 5 December 2017

Revised Date: 3 March 2018

Accepted Date: 7 March 2018

Please cite this article as: N.S. Mousavi, S. Khosharay, Investigation on the interfacial behavior of aqueous solutions of cetyltrimethyl ammonium bromide in presence of polyethylene glycols, *Fluid Phase Equilibria* (2018), doi: 10.1016/j.fluid.2018.03.004.

Investigation on the interfacial behavior of aqueous solutions of cetyltrimethyl ammonium bromide in presence of polyethylene glycols

Nayereh Sadat Mousavi[1], Shahin Khosharay[1*]

[1]Iranian Institute of Research & Development in Chemical Industries (IRDCI-ACECR), Tehran, Iran

* Corresponding author, E-mail: khosharay@irdci.ac.ir

Abstract

The surface tensions of aqueous cetyltrimethyl ammonium bromide and four polyethylene glycols were measured experimentally at the temperature of 298.15 K and the pressure of 1 atm. Then the surface tensions of aqueous (cetyltrimethyl ammonium bromide+polyethylene glycols) were measured at different concentrations. These measurements were conducted with the pendant drop method. The surface tensions of these aqueous solutions were described by using the equality of chemical potentials at the interface and bulk liquid. The calculated results showed a good agreement with experimental measurements, so the model was successfully applied to aqueous cetyltrimethyl ammonium bromide, polyethylene glycols, and their mixtures. Moreover, the surface coverage, molar surface area, and surface-to-solution distributions were determined by this model. The values of critical micelle concentration were obtained through surface tension measurements for each aqueous solution. The presence of polyethylene glycols increased the values of the critical micelle concentration and decreased the surface coverages of cetyltrimethyl ammonium bromide.

Keywords: Cetyltrimethylammonium bromide; Polyethylene glycol; Critical micelle concentration; Surface tension

1. Introduction