

## Surface Properties of Nonionic Surfactants in Aqueous Solutions of Alkanolamines

J. Aguila-Hernández<sup>C, S</sup>

*Programa de Ingeniería Molecular - Área de Investigación en Termodinámica, Instituto Mexicano del Petróleo, México D. F., Mexico*

A. Trejo

*Competencia de Ciencias Básicas, Instituto Mexicano del Petróleo, México D. F., Mexico*

The surface properties of two commercial nonionic surfactants: brij 92 (polyoxyethylene glycol oleyl ether), and tween 80 (polyoxyethylene glycol sorbitan monooleate), have been investigated. In this work we have used the pendant drop method to determine the equilibrium surface tension as a function of concentration of each surfactant in aqueous solution of alkanolamines (MDEA + DEA), at the temperatures of 313.15 and 323.15 K. The total amine concentration for the ternary mixtures was held constant at 45 mass %, with 32.5 mass % of MDEA and 12.5 mass % of DEA. From these measurements we have determined the maximum surface excess concentration and the minimum area per molecule of each surfactant at the aqueous solution/air interface, also the critical micelle concentration, the surface pressure at the cmc, and the standard thermodynamic quantities of adsorption and micellization. The critical micelle concentration (cmc) of both surfactants decreases as the temperature increases. The cmc of the surfactants varies as follows: polyoxyethylene glycol oleyl ether > polyoxyethylene glycol sorbitan monooleate, at both temperatures studied. Our data indicate that the presence of the two alkanolamines gives rise to different surface properties of the two surfactants with respect to those for nonionic surfactants + water systems.