

Solubilization of p-alkylphenols in Pluronics F-68 and F-127 micelles: Partition coefficients and effect of solute on the aggregate structure

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The partition of a series of substituted phenols between water and polymer micelles formed by Pluronic F-68 and F-127 has been studied. The formation of micelles by these block copolymers has been evidenced by steady-state fluorescence and dynamic light scattering. The data show that micelles and larger aggregates are formed above the critical micelle concentration. In presence of p-alkylphenols a micelle rearrangement occurs that leads to the formation of just one and large aggregate. This effect depends both on polymer and phenols structures. The partition coefficients and the standard free energies of transfer from the aqueous to the micellar phases were determined. The incremental free energy for a methylene group are 2.88 kJ mol⁻¹ and 1.65 kJ mol⁻¹ for F-127 and F-68, respectively. This difference is explained in terms of the core sizes that are determined by the length of the PPO block. © 2014, Sociedad Chilena de Quimica. All right reserved.

Block copolymers

Critical micelle concentration

Dynamic light scattering

Fluorescence probing methods

Free energy of transfer

Partition

Pluronic

Polymer micelles