

Solubilization of p-nitrophenol in aggregates formed by hydrophobically modified polyelectrolytes

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The solubilization of p-nitrophenol into the hydrophobic microdomains provided by polyelectrolytes carrying alkyl side chains of different length has been investigated in aqueous solutions of pH 5.0 and 8.0. Under these pH conditions p-nitrophenol is predominantly present in its neutral and ionic forms, respectively. Potassium salts of poly(maleic acid-co-1-olefins), PA-nK₂ with n=12,14,16,18, were synthesized, and the pseudo-phase model was used to determine the distribution coefficient K_S , and the standard free energy of transfer ΔG° of p-nitrophenol between water and polymer aggregates. The results indicate that at both pH's the solubilization of p-nitrophenol increases with increasing size of the side alkyl chain; i.e., the values of K_S follow the order PA-18K₂ > PA-16K₂ > PA-14K₂ > PA-12K₂. The free energies, ΔG° , were plotted as a function of the number of carbon atoms in the side alkyl chain and a linear relation was found. From these plots contributions of -0.324 and -0.676 k