

The effect of pH and salt concentration on the coexistence curves of aqueous two-phase systems containing a pH responsive copolymer and Polyethyleneglycol

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ABSTRACT

The influence of pH and salt concn. on the coexistence curves of aq. two-phase systems contg. a pH responsive copolymer and polyethylene glycol (PEG) is investigated exptl. The copolymer contains different fractions of anionic polyelectrolyte (APE) and polybetaine (PB) at different pH levels. Compatibility of the two polymers was found to increase with increasing the polyelectrolyte fraction of the copolymer. At high PB content, the copolymer was found to collapse to a very small size under intramol. electrostatic attractions between opposite charges. The large size asymmetry between the copolymer and the PEG is thought to be the main cause of incompatibility. Salt was found to screen charges and to minimize the influence of pH on compatibility. A two-parameter semi-empirical model was developed, based on the modification of Guan, Y. et al. (1993, 1994) binodal model, to describe the coexistence curve. The model reproduces exptl. data accurately. Accuracy of the model was found to increase with increasing size asymmetry of the two polymers.