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SURFACTANT AND ELECTROLYTE EFFECTS ON LATEX DEPLETION FLOCCULATION BY THICKENERS

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Polymer thickeners can induce good dispersion, bridging, or depletion flocculation of latexes depending on the polymer structure and concentration. Unlike nonassociative polymers, associative polymers have the ability to create a good latex dispersion. However, when the associative interactions are destroyed, depletion flocculation of the latex can result. This happens when an excess of ionic surfactant is added to the system. In addition, the surfactant may associate with the thickener backbone, thus modifying the molecular volume of the polymer thickener. This paper explores the effect of anionic surfactant and electrolyte on the molecular volume of both associative and nonassociative thickeners. Both HEUR and HASE structures are included. For HEUR thickeners, formation of a pseudo polyelectrolyte through the association of anionic surfactant with the polyethylene oxide backbone is confirmed. Further, the ability of the thickener to depletion flocculate latexes as a function of surfactant and electrolyte is explored. Experimental critical flocculation concentrations (CFC) are compared to values expected based on molecular volume and potential energy calculations. A good correlation is found between molecular volume and CFC for a wide range of thickener compositions.