

Abstract Submitted  
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**Phase separation induced by polymer-ionic molecule complexation** ISSEI NAKAMURA, AN-CHANG SHI, McMaster University — The miscibility of polymers in ionic solutions has attracted long-standing interest in polymer science. In particular, it has been demonstrated experimentally that phase separation can be driven by complexation of polymers and ionic-molecules. Thermally reversible strong forces such as hydrogen bonding and electrostatic force are often employed to induce the complexation. In this study, we developed a self consistent field theory for polymers which are capable of binding small ionic molecules. Specifically, poly(vinyl alcohol) and borate ion in aqueous solution with sodium chloride are used as a model system. Binding isotherm, phase diagrams, as well as comparisons with experiments, will be presented. The theory provides a closed-loop region for an instability of the homogeneous phase in the phase diagram. Implications of our results to the sol-gel transition arising from the correlation between unoccupied and occupied ion-binding sites of polymers are discussed.

Issei Nakamura  
McMaster University

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