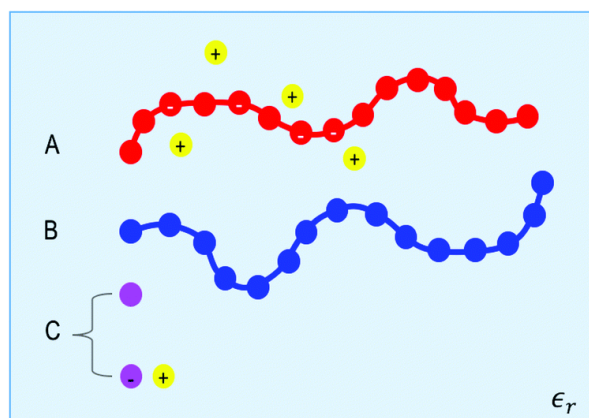


Solubility and Interfacial Segregation of Salts in Ternary Polyelectrolyte Blends

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Caption: Schematic of the model system. Polymer chains of type A and B are described by Flory–Huggins interaction parameter unless otherwise indicated. The polymers are in a homogeneous dielectric environment that gives rise to the ionic correlation strength between ions and the counterions.

Scientific Achievement

Solid Polymer Electrolytes (SPEs) consisting of ternary blends of charged polymer, neutral polymer, and plasticizer or salt have received much interest for their low volatility and high flexibility of polymers with ion-selective conductivity of the charge-carrying backbone. It has been shown that in these polyelectrolyte blends, where the dielectric constant is relatively low, ionic correlations can significantly influence phase behavior.

Significance

Mean-field theories that neglect correlation effects dominate a large majority of the theoretical treatments of polymeric systems. This work quantifies some of the ways that these theories break down, illustrating the sorts of situations where more complicated theories are necessary.

Citation

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