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Morphology of Block Copolymer Electrolytes: A Numerical Self-Consistent Field Theory Study KEVIN HOU, Stanford Univ, JIAN QIN, Stanford University — Engineering the morphology of ion-containing block copolymers is imperative for the optimization of their charge-transport and mechanical properties. Existing experiments have demonstrated that the addition of ions has a dramatic effect on the morphology and thermodynamic behavior of these structured electrolytes. We have developed an efficient, symmetry-adapted algorithm to calculate the ionic interactions in the SCFT for ion-containing polymers. We present the results of a numerical SCFT study examining how dielectric heterogeneity, ion concentration, and ion solvation affect morphology, domain spacing, ion distribution, and polymer density profiles. Particular attention is given to the detailed morphological analysis of the bicontinuous gyroidal phase, as well as the relevance of the aforementioned results to ionic conductivity.

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