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The effect of salt on the morphologies of compositionally asymmetric block copolymer electrolytes WHITNEY LOO, JACQUELINE MASLYN, HEE JEUNG OH, NITASH BALSARA, Univ of California - Berkeley — Block copolymer electrolytes are promising for applications in lithium metal solid-state batteries. Due to their ability to microphase separate into distinct morphologies, their ion transport and mechanical properties can be decoupled. The addition of lithium bis(trifluoromethanesulfonyl)imide (LiTFSI) salt to poly(styrene)-block-poly(ethylene oxide) (SEO) has been shown to increase microphase separation in symmetric block copolymer systems due to an increase in the effective interaction parameter (χ_{eff}); however the effect of block copolymer compositional asymmetry is not well-understood. The effect of compositional asymmetry on polymer morphology was investigated through small and wide angle X-ray scattering (SAXS/WAXS). The effective Flory-Huggins interaction parameter was extracted from the scattering profiles in order to construct a phase diagram to demonstrate the effect of salt and compositional asymmetry on block copolymer morphology.

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