

Abstract Submitted
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Ordering of Triblock Copolymer Surfactants by Blending with a Room Temperature Ionic Liquid DANIEL MIRANDA, JAMES WATKINS, THOMAS RUSSELL, University of Massachusetts — Well-ordered block copolymer morphologies were obtained by blending Pluronic® PEO-PPO-PEO triblock copolymer surfactants with the room temperature ionic liquid 1-butyl-3-methylimidazolium hexafluorophosphate. The selective association of the ionic liquid with the PEO blocks raises the effective interaction parameter between the PEO and PPO blocks. Therefore, the copolymer/ionic liquid blends form well-ordered microdomains in the melt, whereas the neat copolymers are phase mixed in the melt. The ionic liquid was confirmed to interact with the PEO chains by a depression in the melting point of the PEO crystals with increasing ionic liquid concentration. Wide angle x-ray scattering and polarized optical microscopy also indicate disruption of PEO crystallization in the blends. Infrared spectroscopy also indicates a strong interaction between the PEO blocks and ionic liquid. The formation of well-ordered microdomains is demonstrated by small angle x-ray scattering experiments, which show the appearance of higher order peaks with increasing ionic liquid concentration.

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