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Structure of PS/PMMA Blends with Interfacially Active Janus Particles Derived from ABC Triblock Copolymers KYLE BRYSON, University of Massachusetts - Amherst, TINA LÖBLING, University of Bayreuth, AXEL MÜLLER, Johannes Gutenberg University, RYAN HAYWARD, THOMAS RUSSELL, University of Massachusetts - Amherst — Kinetic trapping of bicontinuous polymer morphologies on submicron length scales through the interfacial adsorption of nanoparticles is of interest due to the unique combination of the properties of each component provided by such structures, and their potential for use as membranes and composite materials. However, this strategy is challenging to realize in polymeric systems, due to the difficulties in preparing particles that are neutrally wetted by the two polymer phases. Janus particles afford a route to circumvent the necessity of neutral wettability. Both theory and experiment have shown enhanced interfacial adsorption energies for Janus particles, as well as greater flexibility in controlling particle orientation at the interface, in comparison to homogeneous particles. Janus particles with polystyrene and poly(methyl methacrylate) (PS/PMMA) hemispheres and a crosslinked polybutadiene core were prepared from triblock copolymers. Using blends of PS and PMMA homopolymers and the Janus particles, we examined structures produced by phase separation during solvent casting and thermodynamic demixing transitions via TEM and small-angle light scattering. The results elucidate the role of particle wettability on interfacial behavior and the structure of stabilized emulsions.

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