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Emulsions of Polymer Blends Stabilized by Janus Particles KYLE BRYSON, RYAN HAYWARD, THOMAS RUSSELL, University of Massachusetts - Amherst — Particle-stabilized emulsions of both immiscible and partially miscible polymer blends have recently received renewed interest. In particular, bicontinuous stabilized emulsions are attractive for their three-dimensional expression of the properties of each component, but a true incarnation of this structure has yet to be demonstrated in polymer systems, due to the difficulties in preparing particles that neutrally wet both polymer phases. Janus particles, which possess different surface chemistries on two halves of the particles, afford a way to bypass the necessity of neutral wettability. Both theory and experiment have shown enhanced interfacial adsorption energies for Janus particles, in comparison to homogeneous particles. To investigate these concepts, silica particles were homogeneously and anisotropically functionalized and dispersed in fluid mixtures; interfaces were created by thermally induced phase separation or mechanical mixing. The resulting structures were characterized by laser-scanning confocal microscopy and transmission electron microscopy. The results elucidate the role of particle wettability on the structure of stabilized emulsions.

Kyle Bryson
University of Massachusetts - Amherst

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