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Effect of Macromolecular Architecture on the Morphology of Polystyrene/Polyisoprene Block Copolymers CALEB DYER, The University of Tennessee, PARASKEVI DRIVA, Oak Ridge National Laboratory, SCOTT SIDES, Tech-X Corporation, BOBBY SUMPTER, JIMMY MAYS[1], MARK DADMUN[2], Oak Ridge National Laboratory, FENG ZUO, FRANK BATES, University of Minnesota — The molecular architecture of branched block copolymers has been shown to dramatically effect morphological behavior. A study of four polystyrene/polyisoprene block copolymers with varying architecture (branched $PSPI_2$, PS_2PI, PS_2PI_2, and linear PSPI), and constant composition and molecular weight is presented. The morphologies of each sample were determined using SCFT simulations and, experimentally using SAXS and TEM. The PS_2PI_2miktoarm star exhibits the same morphology as the lineardiblock but with a reduction in the domain size. The PS_2PI and $PSPI_2$ copolymers demonstrated different morphologies from the diblock copolymer, a result of the architectural asymmetry. The results were then compared to Milner's theoretical predictions and found to be in good agreement. These results, therefore, provide detailed insight into the effect of copolymer architecture on the morphological behavior of block copolymers.

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