



~~~~ Polymer Physics Seminar ~~~~

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301 Steidle Bldg.

Morphology and Transport Properties of Midblock-sulfonated Triblock Copolymers

The morphology and transport properties of newly reported sulfonated triblock copolymers with varying degrees of sulfonation in the midblock and two different hydrophobic endblock compositions were studied. The methacrylate-*b*-styrene-*b*-methacrylate triblock copolymers were grown from the center of the polymer chain by atom transfer radical polymerization using a difunctional initiator. It was found that the degree of sulfonation had a systematic effect on the block copolymer domain size as measured by small-angle x-ray scattering. Additionally, the degree of self-assembly of copolymers with hexylmethacrylate endblocks was greater than that of the samples with perfluorooctylmethacrylate endblocks as evidenced by higher order x-ray scattering peaks and transmission electron microscopy. The phase ordering of the materials appeared to be controlled by the solvent casting properties and glass transition temperature of the outer blocks. Increased order and high sulfonation levels led the poly(hexyl methacrylate)-*b*-sulfonated poly(styrene)-*b*-poly(hexyl methacrylate) materials to have much greater conductivity than analogous samples with poly(perfluorooctyl methacrylate) endblocks.