

## Refractive Index Matching Block Copolymers from Ring-Opening Metathesis Polymerization

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Synthesis and processing of polymers with high sulfur or fluorine content have posed a formidable challenge to polymer scientists largely due to the strongly insoluble nature of such materials. Recently, polymer synthesis under heterogeneous conditions have been developed and refined, allowing for the preparation of insoluble polymers in the form of well-defined nanostructures directly from the polymerization reactions. A crucial synthetic element in this approach is a proper stabilization of the insoluble polymer during polymerization. One recent strategy involves the use of a soluble first block as a dispersing agent, from which the second, insoluble block can be synthesized. We have recently expanded this strategy to two distinct classes of molecules – polysulfide-bearing compounds and heavily fluorinated compounds – which are soluble in their monomeric forms but polymerize to give insoluble products. These compounds have been utilized in the direct synthesis of various polymer nanostructures. The amount of sulfur or fluorine in these polymers could be controlled easily, which translated to the variations in their refractive indexes.