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Self-Organization of PS-b-PFOMA Block Copolymer Aggregates in Thin Films YUAN LI[1], LUCIANA MELI[2], KEITH JOHNSTON, Graduate Program of Materials Science and Engineering, Department of Chemical Engineering, The University of Texas at Austin , KWON LIM, Division of Image and Information Engineering, Pukyong National University, Korea, PETER GREEN, Department of Materials Science and Engineering, The University of Michigan — SFM, STEM and XPS were employed to study the morphologies of polystyrene-b-poly(1,1',2,2'-tetrahydroperflurooctyl methacrylate) (PS-b-PFOMA) films. The copolymer was dissolved in the co-solvent mixture of Freon 113 and toluene. Upon spin-casting on Si/SiOx substrate, PS-b-PFOMA was found to self-organize into spherical aggregates, where the cores of the spheres were composed primarily of PFOMA and the matrix was composed by PS. However, exposing the films to supercritical CO_2 led to a reversed morphology, where spheres of PS were embedded in the matrix of PFOMA. In addition, the degree of ordering was improved in sc-CO_2 and the domain size was tuned by adjusting sc-CO_2 density. The results were discussed based on the effects of sc-CO_2 on the interfacial tension and the relative PS-PFOMA interactions.

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