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Long Range Order of Block Copolymer/C_{60} Thin Films KATIE CAMPBELL, DAVID BUCKNALL, YONATHAN THIO, Georgia Institute of Technology — The use of block copolymers as a template to localize C_{60} particles was investigated. The addition of C_{60} fullerenes to poly(styrene-*b*-dimethylsiloxane) thin films leads to disorder in a system that is otherwise ordered in the range of tens of microns. Because C_{60} segregates into the PS phase, the degree of disorder is dependent on the concentration of C_{60} as a weight percent of the PS block, as indicated by AFM studies. Disorder effects are exacerbated by fullerene aggregation in the solution prior to spin coating on a substrate. Several strategies are proposed for achieving and maintaining long-range order in block copolymer/C_{60} thin films. First, the aggregation of C_{60} in solution is controlled by preparing thin films from solutions with C_{60} and block copolymer co-dissolved at a time when aggregation is at a minimum to achieve good dispersion of the C_{60}. Secondly, several methods for achieving long-range order have been investigated including the use of solvent annealing in combination with shear and topographic substrates. Results have shown that solvent annealing alone orders poly(styrene-*b*-butadiene-*b*−styrene) copolymers without C_{60}; however, addition of C_{60} to the system alters the order seen with solvent annealing.

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