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Methods for Self-Assembly of Rod-Coil Diblock Copolymer Thin Films SAMANTHA COLLINS, AMANDA KAMPS, MICHAEL FRYD, RUSSELL COMPOSTO¹, SO-JUNG PARK², University of Pennsylvania — Long range order in diblock copolymer (BCP) thin films can be induced by solvent annealing. First, thin films of semiconducting BCPs were spin-coated onto base-treated and hydroxyl-terminated silicon substrates. These BCP films were then solvent vapor annealed in inert, solvent-saturated atmosphere. Structure was investigated as a function of substrate end group, film thickness, and solvent annealing duration, and an optimized ordering condition was found. Film thickness was varied to direct the morphology perpendicular to the substrate for potential photovoltaic device applications. Second, BCP thin films were processed by novel thermal gradient annealing as an alternative route to directing long range order in the films. The effect of thermal gradient steepness and temperature range on ordering was analyzed for the optimized thickness determined by solvent annealing.

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