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Block Copolymer Based Supramolecules for Organoelectronics BENJAMIN RANCATORE, Department of Chemistry, UC Berkeley, SHIH-HUANG TUNG, Department of Materials, UC Berkeley, CLAYTON MAULDIN, Department of Chemistry, UC Berkeley, PAUL TILLBERG, Department of Materials, UC Berkeley, CLAIRE WOO, Department of Chemical Engineering, UC Berkeley, JEAN M.J. FRECHET, Department of Chemistry, UC Berkeley, TING XU, Department of Materials, UC Berkeley — Block copolymer (BCP)-based supramolecules present unique advantages over conjugated BCPs to fabricate functional devices such as OLEDs and photovoltaics. The self assembly of 5"'-(3,7-dimethyloctyl)-5-(3-(3-hydroxyphenyl)propyl)-[2,2';5',2";5",2"'] quaterthiophene (4T) hydrogen bonded to the poly(4-vinylpyridine) (P4VP) block of polystyrene-b-poly(4-vinylpyridine) (PS-b-P4VP) BCP was studied in bulk and thin films. Lamellae-within-lamellae hierarchical structure was observed and can be macroscopically oriented at both length scales in thin films. Films of pure 4T, P4VP(4T) and PS-b-P4VP(4T) composites were investigated as organic field-effect transistors (OFETs). Phase behavior of blends of the BCP-based supramolecule and PCBM were also investigated to guide the fabrication of organic photovoltaics.

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