

Abstract Submitted
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PCBM Functionalized Block Copolymer films for Photovoltaic Applications¹ ABUL M.A. HUQ, MANISH M. KULKARNI, ALAMGIR KARIM, Department of Polymer Engineering, University of Akron, USA — For efficient charge separation we examine block copolymer thin films as model nanoscale templates that can be utilized for OPV applications. If one can incorporate acceptor and donor in two different blocks, efficient charge separation can be possible. Microphase separation in block-copolymer (BCP) systems, a result of chemical incompatibility of the constituent polymer blocks can be used to control the nanoscale domain sizes. Here, Polystyrene-*b*-Polyethyleneoxide (PS-PEO) block copolymer, with the PEO being the cylinder forming phase was used because of its robust structural nature to form vertical nanomorphology of cylinders. The acceptor material, PCBM was incorporated into the block-copolymer at different concentration levels up to high levels (~30%). Both TEM and AFM study showed that PCBM was well dispersed at up to 3:10 (PCBM:PS-PEO) in the block copolymer matrix. This amount is close to percolation threshold of PCBM at which independent donor and acceptor path is expected to be achieved. Further investigations by neutron scattering methods for possible numerous electronic applications including OPV are underway.

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