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Correlations between Morphologies and Photovoltaic Properties of RodCoil Block Copolymers VENKAT GANESAN, MANAS SHAH, VICTOR PRYAMITSYN, The University of Texas at Austin — We present results obtained using a drift-diffusion model for the structure-property correlations in photovoltaic devices based on self-assembly of rod-coil block copolymers. We use a self- consistent field theory model to generate the self-assembly morphologies of rod-coil block copolymers in confined situations. The density and orientational order parameter profiles so-obtained are then used as input to a recently proposed drift-diffusion model which predicts the photovoltaic device characteristics. The latter model allows for prescription of arbitrary morphologies of donor and acceptor phases while simultaneously incorporating the role of anisotropic charge transport of holes and excitons that arise in the ordered phases of rod-coil block copolymers. We present results elucidating the role of morphology of self-assembly, orientation of lamellar phases, domain widths, and the degree of phase separation and orientational ordering, upon the photovoltaic device characteristics.

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