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Tuning polymer/inorganic blend morphology using pyridine terminated poly(3-hexylthiophene)s: Novel ligands for potential OPV applications W. MICHAEL KOCHEMBA, S. MICHAEL KILBEY II, University of Tennessee, DEANNA L. PICKEL, BOBBY G. SUMPTER, Oak Ridge National Laboratory — End-functional pi-conjugated polymers are promising materials for the improvement of organic electronic devices due to their high hole mobility and ease of processability. Here we describe a "materials by design" approach to create 2- and 3-pyridyl, end-functionalized poly(3-hexylthiophene)s (P3HTs) that possess the capacity to ligate semiconductor quantum dots (SQDs). The replacement of native ligands on the SQD surface by pyridyl-terminated P3HTs provides the opportunity to manipulate the morphology of polymer/inorganic blends created by dispersing the P3HT-ligated SQDs in a P3HT matrix. TEM imaging and small angle x-ray scattering were used to assess the morphological traits of the blends as a function of ligand type, processing condition, and matrix molecular weight, which in general show that the P3HT ligands improve dispersion of the nanoparticles upon thermal annealing.

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