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Organic-Inorganic Nanocomposites via Directly Grafting Conjugated Polymers onto Quantum Dots ZHIQUN LIN, Iowa State University, JUN XU, JUN WANG, MIKE MITCHELL, PRASUN MUKHERJEE, MALIKA JEFFRIES-EL, JACOB W. PETRICH, Iowa State University — Nanocomposites of poly(3-hexylthiophene)-cadmium selenide (P3HT-CdSe) were synthesized by *directly* grafting vinyl terminated P3HT onto [(4-bromophenyl)methyl]dioctylphosphine oxide (DOPO-Br)-functionalized CdSe quantum dot (QD) surfaces via a mild palladium-catalyzed Heck coupling, *thereby dispensing with the need for ligand exchange chemistry. The resulting P3HT-CdSe nanocomposites possess a well-defined interface, thus significantly promoting the dispersion of CdSe within the P3HT matrix and facilitating the electronic interaction between these two components.* The photophysical properties of nanocomposites were found to differ from the conventional composites in which P3HT and CdSe QDs were physically mixed. Solid-state emission spectra of nanocomposites suggested the charge transfer from P3HT to CdSe QDs, while the energy transfer from 3.5-nm CdSe QD to P3HT was implicated in the P3HT/CdSe composites. A faster decay in lifetime further confirmed the occurrence of charge transfer in P3HT-CdSe nanocomposites.

Zhiqun Lin
Iowa State University

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