

Abstract Submitted  
for the MAR11 Meeting of  
The American Physical Society

**Semiconducting Nanocomposites via Directly Grafting Conjugated Polymer onto Quantum Rods** LEI ZHAO, XINCHANG PANG, ZHIQUN LIN, NANOFM TEAM — Nanocomposites of poly(3-hexylthiophene) (P3HT)-cadmium selenide (CdSe) nanorod (NR) were synthesized by directly grafting P3HT onto bromobenzylphosphonic acid (BBPA) functionalized CdSe NR, dispensing with the need for ligand exchange chemistry. The grafting was accomplished by Heck coupling as well as a newly developed catalyst-free click reaction. The resulting P3HT-CdSe NR nanocomposites possess a well-defined interface, thereby significantly promoting the dispersion of CdSe within the P3HT matrix and facilitating the electronic interaction between them. The success of grafting was confirmed by the NMR and DLS, and the occurrence of charge transfer at P3HT/CdSe NR interface was demonstrated by the UV-vis absorption and photoluminescence (PL) measurements as well as the time-resolved PL study. Similar grafting density was yielded using these two methods. The nanocomposites prepared by the catalyst-free click reaction was found to exhibit a faster charge transfer. To the best of our knowledge, this is the first study of grafting conjugated copolymer directly onto the elongated semiconductor nanomaterials. As such, it provides insight into rational design and fabrication of organic-inorganic nanohybrid solar cells with improved power conversion efficiency.

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Date submitted: 12 Nov 2010

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