Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Self-Assembly of CdSe and PbS/PbSe Quantum Dots on Gold and other Surfaces Using Dithiol Functionalization JEFFREY SCHWARTZ, MIAOXIN ZHOU, ANVAR ZAKHIDOV, The University of Texas at Dallas — CdSe and PbS/PbSe quantum dots were deposited onto gold surfaces functionalized with self-assembled monolayers of dithiol molecules. Separately, quantum dots were treated in solution with dithiols to create linked quantum dot chains and then deposited onto gold and other surfaces. Analysis of the samples via atomic force microscopy and scanning tunneling microscopy was performed in order to characterize the samples and determine the ordering and level of coverage of the quantum dots on the substrate surface. We show that using benzenedithiols allows for increased electrical conductivity of self-assembled quantum dot layers and found the optimal conditions for maximum coverage and best ordering. This research is done with the intention of using linked, ordered, quantum dot chains in polymer solar cell devices, and embedding quantum dots inside opals and inverse opals to create negative index materials.

Jeffrey Schwartz
The University of Texas at Dallas

Date submitted: 21 Nov 2008 Electronic form version 1.4