Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Assembly of Conjugated Polymers- Gold Nanoparticles NARESH OSTI, THUSITHA ETAMPAWALA, DILRU RATNAWEERA, Clemson University, Clemson, SC 29634, UWE BUNZ, School of Chemistry and Biochemistry, Georgia Institute of Technology, Atlanta, GA 30332, VINCENT ROTELLO, Department of Chemistry, University of Massachusetts, Amherst, MA 01003, DVORA PERAHIA, Clemson University, Clemson, SC 29634 — The formation of hydrophilic modified *disubstituted para-polyphenyleneethylene* (PPE) nanoparticles (NP) complexes in aqueous media and their assemblies have been investigated. Both PPEs and gold NPs are electro-optically active. Controlling their association would allow formation of electro-optical tunable responsive materials. Small Angle Neutron Scattering (SANS) in conjunction with Atomic Force Microscopy (AFM) has been used to characterize the structures of the complexes formed. SANS studies have shown that spherical core shell NP-P complexes are formed in dilute solutions, with the gold NPs surrounded by almost fully stretched out PPE chains. With increasing the concentration of the NP-PPE complex in solution chains which consist of the basic core-shell aggregated are observed. These NP-PPE complexes were allowed to assemble at a solid surface. While the basic building block, observed by AFM, remains spherical, they assemble in different ways from random 2-d arrays to cable like structures, depending on the interaction of the NP with the PPEs and the nature of the PPE side chains.

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Date submitted: 14 Dec 2009 Electronic form version 1.4