

Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Control Large Nanoparticle Assemblies in Supramolecular Nanoparticle Thin Films JINGYU HUANG, TING XU, University of California, Berkeley — Nanocomposites can generate new properties beyond those offered by organic and inorganic building blocks to meet the demands in functional materials. The collective properties of nanocomposite materials depend on both the nature of individual building block and their spatial arrangements. With the recent development, colloidal synthesis and surface modification methods provide inorganic nanoparticles (NPs) with various sizes, shapes, compositions and properties in a facile manner. Block copolymer-based supramolecules further provide more versatile routes to control spatial arrangement of the nanoparticles over multiple length scales. Nanoparticle size is a critical parameter determining the optical and electronic properties. However, most of studies to date focused on nanoparticle smaller than 10 nm in size. Here, our recent studies showed that the assembly of nanoparticles with size larger than 10 nm can be achieved in the supramolecular nanocomposite thin films by finely tuning the ligand-polymer interactions and the sample treatment conditions. Both the overall morphology of the nanoparticle assemblies and inter-particle distances can be readily tailored. These new results opened a viable approach to construct functional materials using nanoparticles with different quantum confinement effects.

Jingyu Huang
University of California, Berkeley

Date submitted: 13 Nov 2014

Electronic form version 1.4