

Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Control of the Spatial Distribution of Nanoparticles in Fluorescent Polymer Nanocomposites¹ CHELSEA CHEN, PETER GREEN, University of Michigan, Ann Arbor — In a brush-coated nanoparticle (NP) / polymer nanocomposite system, the spatial distribution of the NPs is largely determined by the entropic and enthalpic interactions between the brush and polymer host chains. We examined the miscibility between polystyrene (PS) homopolymer chains and a fluorescent polymer poly[2-methoxy-5-(2-ethylhexyloxy)-1,4-phenylenevinylene] (MEH-PPV) and found that in thin films, low molecular weight (MW) PS and MEH-PPV are miscible, whereas high MW mixtures exhibit phase separation. Consequences of this behavior were examined with regard to the effect on the morphology of nanocomposite thin films composed of MEH-PPV and thiol terminated polystyrene grafted Au nanoparticles of varying sizes. We were able to achieve complete dispersion, as well as interfacial segregation, of the Au-PS nanoparticles within MEH-PPV hosts. Through control of the morphology, we were able to “tune” the optical properties of the MEH-PV/Au-PS nanocomposites.

¹Supported by DOE#DE-FG02-07ER46412 and NSF#DMR 9871177.

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Date submitted: 22 Nov 2008

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