

Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Effect of Nanoparticle Core Size on Polymer-Coated Gold Nanoparticle Location in Block Copolymers J. D. PETRIE, G. H. FREDRICKSON, E. J. KRAMER, UCSB — Gold nanoparticles modified by short chain polymer thiols [Au-PS] can be designed to strongly localize either in the PS domains of a polystyrene-b-poly(2-vinylpyridine) [PS-PVP] block copolymer or at the interface. The P2VP block has a stronger attractive interaction with bare gold than the PS block. Thus, when the areal chain density Σ of end-attached PS chains falls below a critical areal chain density Σ_c the Au-PS nanoparticles adsorb to the PS-b-P2VP interface. The effect of the polymer ligand molecular weight on the Σ_c has been shown to scale as $\Sigma_c \sim ((R + Rg)/(R \cdot Rg))^2$, where R is the curvature of the Au nanoparticle core radius. To test this scaling relation for Σ_c further we are synthesizing gold nanoparticles with different core radii and will present preliminary results on Σ_c as a function of R .

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Date submitted: 19 Nov 2008

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