

Abstract Submitted
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Size Characterization of Surfactant and Polymer Coated Gold Nanorods¹ CHRISTOPHER GRABOWSKI, PAUL LUCHETTE, PETER PALFFY-MUHORAY, Liquid Crystal Institute - KSU — Polarization-dependent dynamic light scattering was conducted on gold nanorods (Au NRs) coated with CTAB (hexadecyltrimethylammonium bromide) in water and coated with 50k MW PS (polystyrene) in toluene. The autocorrelation function of the scattered light intensity was determined for a series of scattering angles under VH and VV scattering geometries. The data were fit to a model of rotational and translational diffusivities. From this fit, we estimate the effective length (L) and diameter of the coated nanorods in solution. Au NRs coated with 50k PS show greatly reduced rotational diffusion compared to CTAB-coated NRs. Since the rotational diffusion coefficient scales as $1/L^3$, this implies significant extension of the grafted PS chains in toluene. We investigate this phenomenon for PS grafted onto Au nanoparticles and nanorods of varying aspect ratio to determine the impact of surface curvature on polymer layer thickness.

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