

Abstract Submitted  
for the MAR06 Meeting of  
The American Physical Society

**Thermal Stability, and Curvature Dependence of Bovine Serum Albumin on Gold Nanoparticles Using Localized Surface Plasmon Resonance** JONATHAN TEICHROEB, University of Waterloo, JAMES FORREST, University of Waterloo, VALENTINA NGAI — Gold nanoparticles exhibit Surface Plasmon Resonance (SPR), whose absorption peak is strongly dependent on the index of refraction, and coating thickness of the near surface region. A macromolecule bound to the nanoparticle will typically undergo a shift in index of refraction as its conformation changes, leading to a shift in the peak wavelength. Nanospheres can be made with a large variety of diameters, and present a novel method of looking at curvature dependencies of stability. In this study, Bovine Serum Albumin (BSA) was conjugated to Au nanospheres. Using a visible absorption spectrometer, the peak wavelength vs. temperature for eight diameters from 5nm to 60nm, was collected. Diameters above 20nm exhibited a continual increase in peak wavelength with temperature. Theoretical calculations indicate that this is a thickening of the protein layer. Below 20nm, peak wavelength shifts indicated a thinning of the BSA layer, and possible a decrease in index of refraction, followed by thickening at higher temperatures. Additionally, the study indicates that the peak shifts are highly time dependent, and a kinetic study has been performed at several temperatures.

Jonathan Teichroeb  
University of Waterloo

Date submitted: 30 Nov 2005

Electronic form version 1.4