Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Characterization of the Surface of Colloidal Ag NPs by Second Harmonic Light Scattering[1] GRAZIA GONELLA, BOLEI XU, Department of Chemistry, Temple University, Philadelphia, PA 19122, BRENDAN G. DELACY, U.S. Army Edgewood Chemical Biological Center, Research & Technology Directorate, Aberdeen Proving Ground, MD 21010, HAI-LUNG DAI, Department of Chemistry, Temple University, Philadelphia, PA 19122 — Noble metal nanoparticles (NPs) have been studied extensively for their unique optical properties. These properties stem from the fact that metallic NPs can sustain localized surface plasmons (LSPs). We have used second harmonic light scattering (SHS), a coherent and surface-specific technique, to probe citrate-stabilized colloidal Ag NPs and proven that, by using a fundamental beam at twice the wavelength of the LSP resonance, the detected SH signal is generated predominantly at the Ag NP surface. We have also determined how the composition, shape and second-order susceptibility affect the SHS signal from the Ag NPs. Very recently, as self-assembled monolayers (SAMs) on metallic NPs have been rediscovered for their potential in catalysis and as biosensors among others, we have used SHS to study the adsorption process of thiol molecules on the surface of Ag NPs exploiting the ability of non-SH-active thiols to quench the SH signal from the Ag NP surface.

[1]This work has been partially supported by the AFOSR FA-9550-08-1-0092 and STC 13-01-9030-003 (through the Edgewood Chemical Biological Center Research and Technology Directorate Task Order W911SR-10-D0010) grants.

Grazia Gonella
Department of Chemistry, Temple University, Philadelphia, PA 19122

Date submitted: 15 Nov 2013 Electronic form version 1.4