replacing OSF16-2016-000019.

Abstract Submitted
for the OSF16 Meeting of
The American Physical Society

Optimizing Dynamic Light Scattering for the Analysis of Anisotropic Nanoparticles in Solution[1] TONY DOBRILA, None, PHYSICS AND BIOMEDICAL ENGINEERING COLLABORATION — To further our understanding of light scattering on anisotropic soft particles, such as ELP micelles, the light scattering of anisotropic gold nanoparticles was undertaken. We used Depolarized Dynamic Light Scattering (DDLS) and Scanning Electron Microscopy (SEM) to study commercial gold nanoparticles. According to SEM, all particles were larger than the company specs by nearly two times. DLS on 1:1 nanospheres showed no rotational diffusion (VH) signal, scattering vector (q) dependence on decay rate consistent with that of spherical particles, no concentration dependence on the translational diffusion coefficient (D_{VV}), no absorption, and a hydrodynamic radius (R_h) of 12.2 0.4nm. The 3:1 nanorods also revealed no VH signal, spherical q-dependence on decay rate, no concentration dependence on D_{VV}, and a R_h of 20.9 0.5nm. In addition, 3:1 nanorods experienced a change in absorbance as well as color which didn't affect particle diffusion. This was caused by the particle's ability to support a localized surface plasmon resonance (LSPR). LSPR, an optical property of gold and silver allows for the emission of plasmons when light is incident on the particle surface. DDLS on 6.7:1 rods revealed a noticeable VH signal and significant change in absorption, which did not alter diffusion properties of the particles.

[1]Funding was provided by The Summer Undergraduate Research Program

Tony Dobrila
None

Date submitted: 12 Sep 2016 Electronic form version 1.4