



CHEMISTRY SEMINAR 291

Structure and Dynamics at the Surface of Colloidal Objects – from Metallic Nanoparticles to Biological Cells – by Nonlinear Light

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ABSTRACT

Properties of colloids containing micro- and nano-particles as well as thin films are much influenced by the structure of and interactions at the interfaces buried in the condensed medium. It is important that chemists can characterize the buried interface – define its structure and probe the dynamics and kinetics occurring there.

Nonlinear light scattering from colloidal particles has been developed into a powerful and versatile technique for characterizing interfaces, including surfaces of colloidal particles. Today, second harmonic light scattering (SHS) from the particle surface can be quantitatively described by theoretical models and used for measuring adsorption kinetics, molecular structure, and reaction rates at the surfaces of a variety of micron to nanometer size particles. In this presentation, we will show that SHS can be used for the determination of reaction mechanism of thiol adsorption on and the fluorescence quenching mechanism (and therefore we can vastly increase the particle luminescence) of metallic nanoparticles, for revealing how local electric fields at the room temperature ionic liquid surface affect the surface layer structure, and for imaging and quantifying molecular transport through living cell membranes in real time.

