World Academy of Science, Engineering and Technology
International Journal of Electrical and Computer Engineering
Vol:11, No:05, 2017

Light-Scattering Characteristics of Ordered Arrays Nobel Metal Nanoparticles

Authors : Yassine Ait-El-Aoud, Michael Okomoto, Andrew M. Luce, Alkim Akyurtlu, Richard M. Osgood III

Abstract : Light scattering of metal nanoparticles (NPs) has a unique, and technologically important effect on enhancing light absorption in substrates because most of the light scatters into the substrate near the localized plasmon resonance of the NPs. The optical response, such as the resonant frequency and forward- and backward-scattering, can be tuned to trap light over a certain spectral region by adjusting the nanoparticle material size, shape, aggregation state, Metallic vs. insulating state, as well as local environmental conditions. In this work, we examined the light scattering characteristics of ordered arrays of metal nanoparticles and the light trapping, in order to enhance absorption, by measuring the forward- and backward-scattering using a UV/VIS/NIR spectrophotometer. Samples were fabricated using the popular self-assembly process method: dip coating, combined with nanosphere lithography.

Keywords : dip coating, light-scattering, metal nanoparticles, nanosphere lithography
Conference Title : ICMPCP 2017 : International Conference on Metamaterials, Photonic Crystals and Plasmonics
Conference Location : Amsterdam, Netherlands
Conference Dates : May 14-15, 2017