

Comparison of Linker-Molecule-Free Gold Nanorod and Gold Nanosphere films for Surface Enhanced Raman Scattering

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We present a methodology for synthesizing ordering gold nanorods into 2-dimensional arrays at a water/hexane interface. This preparation method allows the systematic control of the nanoparticle film thickness. An investigation into the thickness-dependent surface enhanced Raman scattering (SERS) of the adsorbed molecules revealed the nanorod (NR) films to have one order of magnitude stronger SERS enhancement than the nanosphere (NS) under similar experimental conditions. The difference was attributed to the high density of junction points with the NR films in comparison with the corresponding NS films. Scanning emission microscopy showed that the NR films have line contacts with each other but the NS films have point contacts, which can explain the difference in SERS intensity between the NR and NS films.