The detection of PSA protein biomarker based on resonant Rayleigh light scattering microspectroscopy of individual Au nanoparticles

황우성, 심상준*
성균관대학교 화학공학과
(simsj@skku.edu*)

A proof-of-concept study was reported on analysis of antigen-antibody recognition based on resonant Rayleigh scattering response of single Au nanoparticles in an imaging chamber. As benefited by a traditional dark-field microscope and a spectrograph, individual Au nanoparticles (30 nm) were observed with high signalto-
noise ratio and they were effectively utilized to monitor changes in refractive index induced by specific binding of the adsorbates.
Using PSA antigen as a model, a LSPR λmax shift of about 2.85 nm was recorded for a molecular binding corresponding to 0.1 $pgml^{-1}$of the protein biomarker. This result successfully demonstrates a nonlabeling detection system for proteins.