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Plasmonic Coupling via Au@stimuli-responsive polymer Hybrid Core@shell Nanoparticles Monitored by Surface Plasmon Resonance Spectroscopy JI-EUN LEE, KYUNGWHA CHUNG, DONG HA KIM, Ewha Womans University — Noble metal nanostructures with responsive polymers can be used to probe unique plasmonic properties associated with swelling-shrinking transitions in polymer chains triggered by a specific external stimulus. The phase transition causes changes in the refractive index in the vicinity of the particle surface and induces concurrent changes in the characteristic inter-particle distance. We designed a plasmonic-coupling-based sensing device consisting of Au nanoparticles separated from the Au substrate in Kretschmann configuration SPR spectroscopy through a thermo-responsive polymer linker layer. Concretely, Au NPs having stimuli-responsive polymer chains tethered to the Au surface were first fabricated through SI-ATRP. The optical properties of these stimuli-responsive devices were investigated by both in-situ and static SPR analysis. Also, we demonstrate that bimetallic nanostructures containing another type of metal NP at the stimuli-responsive polymer periphery exhibit a controlled optical sensing property based on LSPR coupling phenomenon.

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