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Microstructural Investigation of Nanosphere Lithography Fabricated Gold Nano-patterns using Polystyrene Monolayers

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Abstract—This nano level research is aimed to successfully fabricate an array of different shapes of gold nano islands on a glass substrate with a certain periodicity. Using Nanosphere Lithography (NSL) technique, Polystyrene (PS) beads were deposited on the interface of air-waterglass. It is revealed that with increase in annealing time, the aperture size among three consecutive beads decreased and changes in PS morphology is also noticed. Annealed monolayers of polystyrene were physically masked with gold and chromium for the easy deposition of the electronic beam. Using a spectrophotometer, Localized Surface Plasmon Resonance (LSPR) property and extinctions having a wavelength shift of LSPR with respect to anneal time is measured.

Keywords—Nanosphere Lithography, Polystyrene, Hexagonal Closed Packed, Localized Surface Plasmon Resonance (LSPR)