Au-capped Elastomeric Pillar Arrays Toward Optofluidic Plasmonic Substrate

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Surface plasmon (SP) is simply defined as oscillation of electrons at interface between metal and dielectric materials. Surface plasmon resonance (SPR) induced from metal nanostructure shape, size, and even surrounding conditions. In this manner, plasmonic substrate has been used in surface enhanced Raman spectroscopy (SERS) to recognize chemicals and bio-molecules. Several different SPR structures have been suggested to maximize tunability and sensitivity. However, previous structures plasmonic properties were defined during fabrication procedures. In this work, Au-capped elastomeric pillar arrays was fabricated by nanoscale molding from hole arrays master pattern and metal deposition with oblique angle on elastomeric pillar arrays. In this system, plasmonic properties could be controlled by changing the gap distance between Au-caps using elastic deformation under mechanical manipulation. We expect that plasmonic elastomer with dynamic tunability has potential for highly sensitive on-demand optofluidic recognition platform.