

Integration of Nanohole Arrays Exhibiting LSPR into a Microfluidic Chip

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The optical properties of metal thin films with subwavelength apertures have prompted great interest recently because of their potential applications in surface plasmon resonance (SPR) biosensors and surface enhanced Raman spectroscopy (SERS). We report here a novel and versatile method that can fabricate a microfluidic device with an integrated nanohole arrays performing as SPR-based chemical and biological sensors. Optical measurements of these structures indicate that arrays of nanoholes can be integrated and used as effective SPR detectors in a microfluidic chip platform. Thus, this integrated device was successfully applied to detect changes in refractive index. In addition, the dependence of these unusual optical properties on the geometric parameters such as diameter, depth, thickness as well as periodicity has also been studied experimentally and theoretically.