Supporting Information

Increasing Local Field by Interfacial Coupling in Nanobowl Arrays

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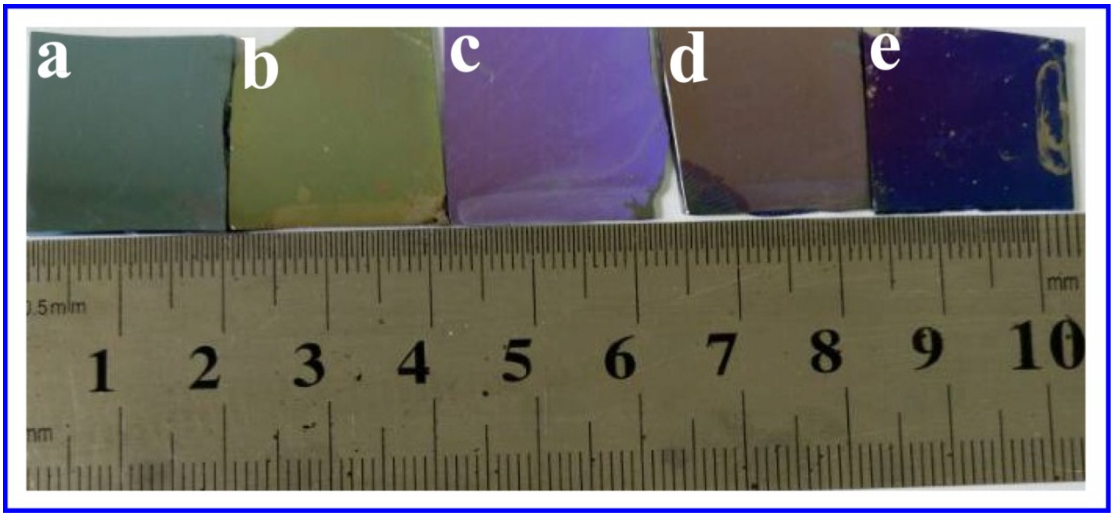

Fig. S1 The picture shows the color changing (gray to deep purple) of (a) PS templates on silicon wafer, (b) Ag films deposited on PS templates without etching, (c)-(e) Ag/SiO_2/Ag films with different SiO_2 thickness: 1 nm, 2nm, 3nm.

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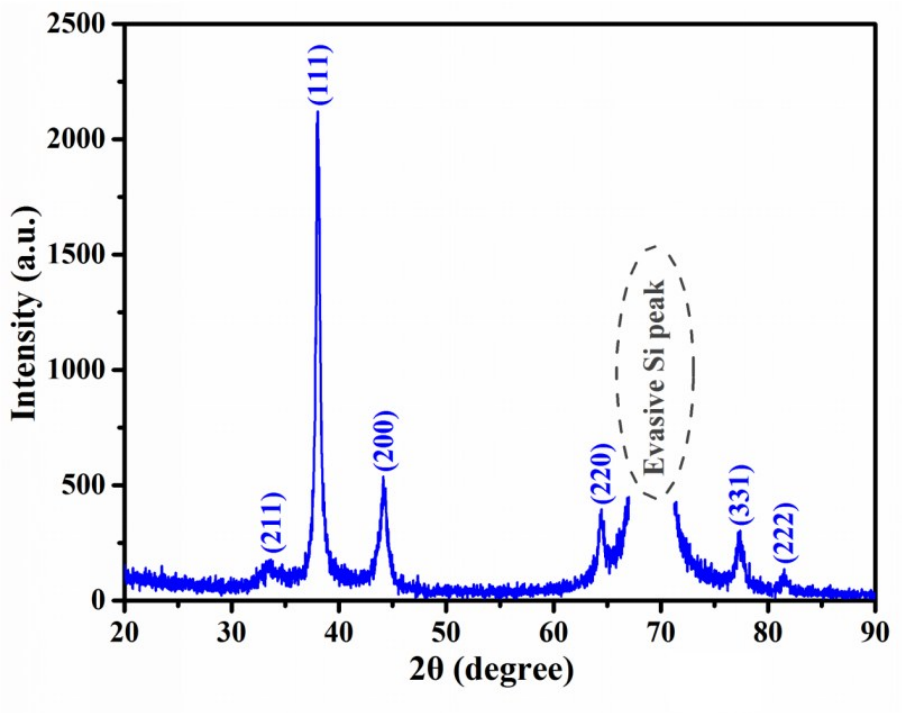

Fig. S2 The X-ray diffraction patterns of 80 nm Ag nanobowl array etched for 60 s.

In order to investigate the crystallographic phases of Ag films, XRD measurement was performed, as illustrated in Fig. S2.All the observed diffraction peaks are indexed to Ag according to JCPDS card No. 04-0783. There are five peaks (2θ) at 38.1°, 44.2°, 64.4°, 77.4°, 81.5°, corresponding to the (111), (200), (220), (311) and (222) planes of silver with the face-centered cubic (fcc) structure, respectively. The intensity ratio of (111) diffraction peak in XRD spectrum is much higher than that of (200). This indicates that the as-prepared Ag nanobowl array is abundant in the (111) plane. The peak located at 33.3° corresponding to the (211) plane is from the silicon substrate. The evasive peak at 69.14° is assigned to the silicon substrate, which possesses the highest intensity.

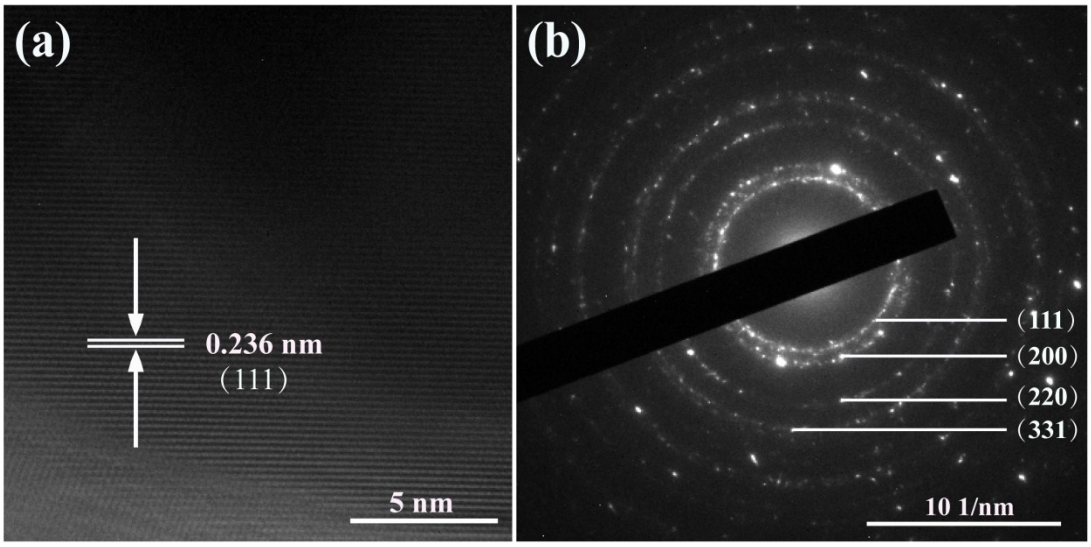

Fig. S3 (a) The high-resolution TEM (HRTEM) images, (b) the selected-area electron diffraction (SAED) pattern of 80 nm Ag nanobowl array etched for 60 s.

As shown in Fig. S3a, the high resolution TEM images of Ag nanobowl show the clear lattice fringe, which further indicates the high crystalline feature of Ag. The corresponding interplanar spacing of 0.236 nm is in agreement with the (111) plane of Ag. Fig. S3b shows selected-area electron diffraction (SAED) pattern of Ag nanobowl, the different planes of Ag material are good consistent with XRD results.

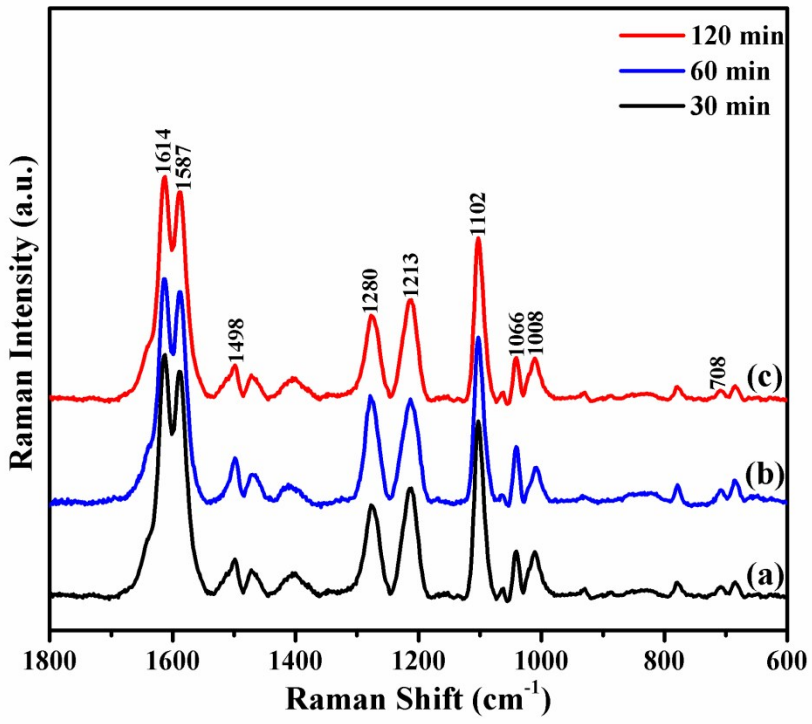

Fig. S4 The SERS spectra of Ag 40 nm/SiO_2 2 nm/Ag 40 nm nanobowl arrays adsorbed in 4-Mpy solution (10^{-3} M) with different time: 30 min, 60 min, 120 min.

Fig. S4 shows that the SERS spectra of Ag 40 nm/SiO_2 2 nm/Ag 40 nm nanobowl arrays adsorbed in 4-Mpy solution (10^{-3} M) with different time: 30 min, 60 min, 120 min. It can be seen that the SERS spectra shows the almost same SERS signals, it illustrates the adsorption have reached to saturation state.