Supporting Information

Island-like Nanoporous Gold:Smaller Island Generates Stronger Surface-Enhanced Raman Scattering

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Table S1 Ag content (at.%) of the prepared samples before and after dealloying. It should be noted that the measured Ag content is underestimated because of an additional ~3 nm Au layer was deposited on the sample before SEM measurement to enhance the electrical conductivity. We believe these data are enough for the relative comparisons of the samples. Besides, residual Ag of NPG sample is much more than INPG samples after 1.5 h dealloying. We think this should be attributed to the larger contacting areas of the ligaments of INPG with the electrolyte than NPG.

	Before dealloying	15 min dealloying	1.5 h dealloying
INPG9	91.09±0.44	6.82±0.87	2.31±0.89
INPG13	87.38±0.59	8.95±1.13	2.13±0.96
INPG18	81.96±0.83	7.57±0.83	2.27±0.76
NPG	66.58±1.22	20.71±1.35	16.31±1.99

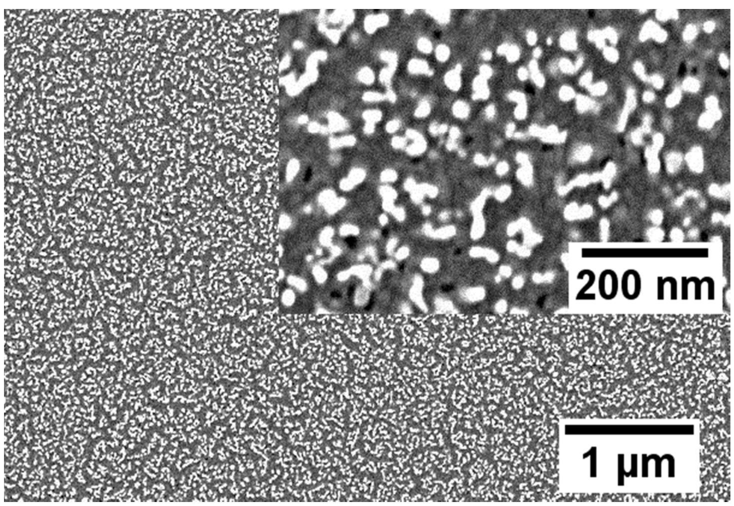

Figure S1. Microstructure of the gold nanostructure bydealloying $Au_{3.9}Ag_{96.1}$alloy precursorfor 1.5 h. It presents as gold nanoparticlemorphology.

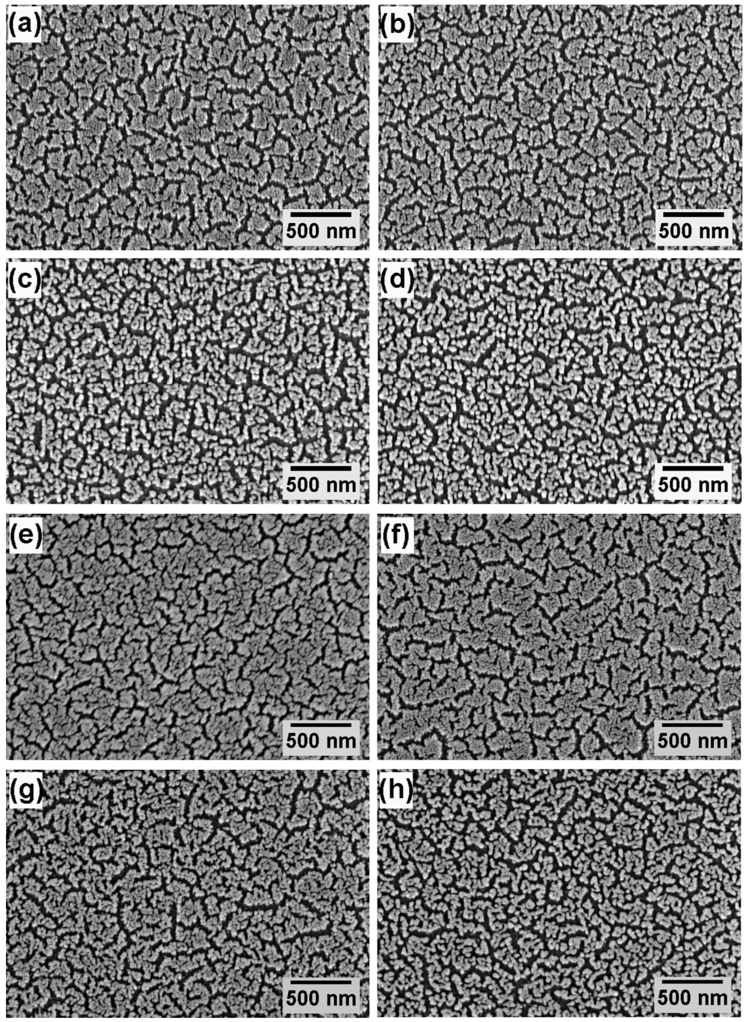

Figure S2. SEM micrographs of INPG9 and INPG13 with different dealloying times to present their morphological evolutions. (a–e) The surface morphologies of INPG9: (a) 0.25 min, (b) 1.5 min, (c) 15 min, (d) 60min. (e–h) The surface morphologies of INPG13: (e) 0.25 min, (f) 1.5 min, (g) 15 min, (h) 60min.

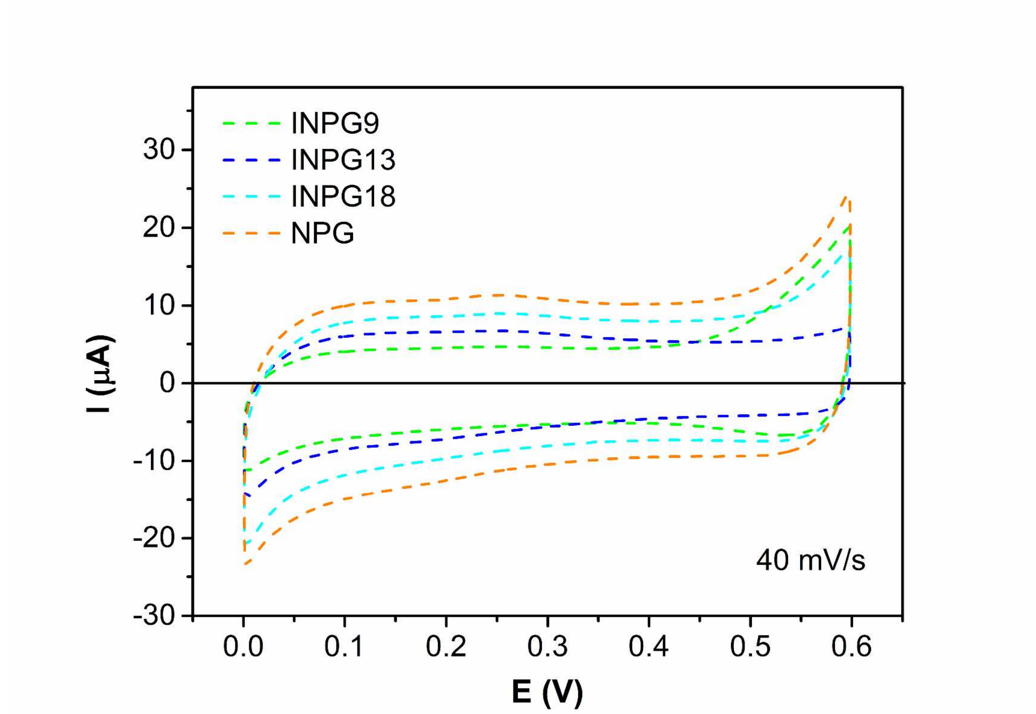

Figure S3. Cyclic voltammograms of current I versus electrode potential E in the nominally capacitive regime of prepared INPG and NPG samples with the scan rate as 40 mV/s.

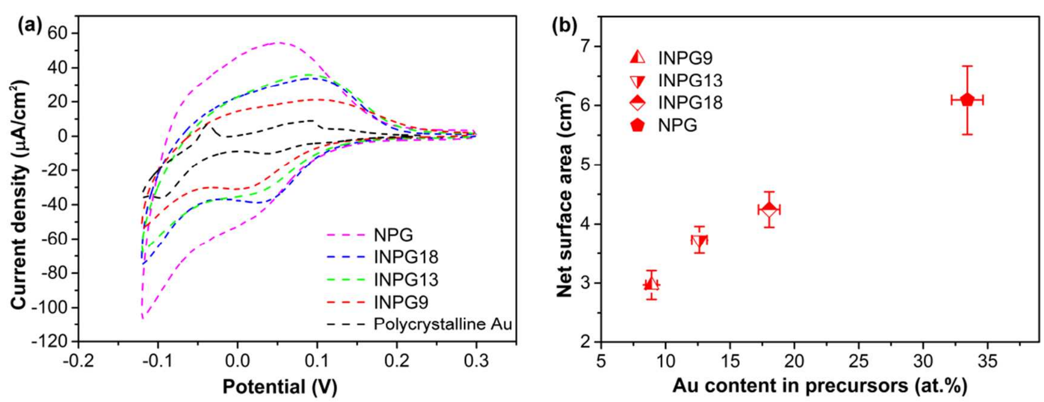

Figure S4.The Cu UPD measurements of the prepared samples for the surface area characterizations. (a) Cyclic voltammograms of Cu UPD measurements. (b) The estimated net surface areas of INPG and NPG samplesversus Au content in precursors. The polycrystalline Au film was measured as reference.

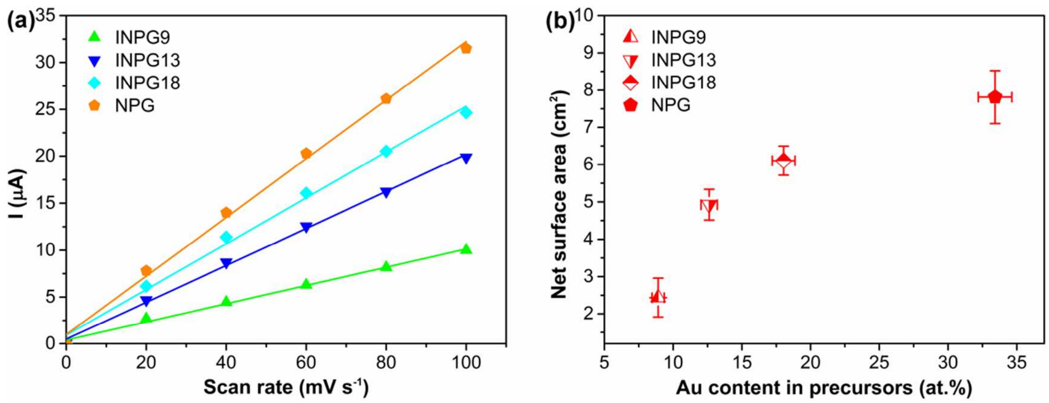

Figure S4. Surface area characterization of INPG and NPG films dealloying by 15 min. (a) Mean current magnitudeI_c at $E = 0.3\,V$ of cyclic voltammograms measurement versus the scan rate. (b) The estimated net surface areas versus Au content in precursors.

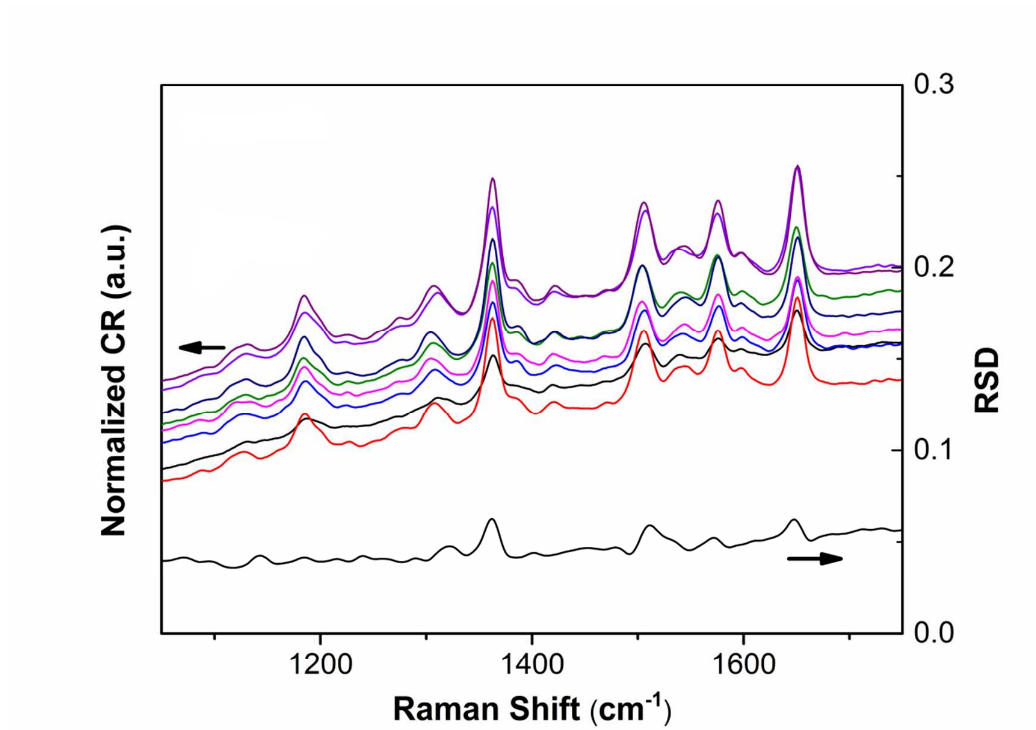

Figure S5. SERS spectra and corresponding RSD values of 10^{-7} M R6G oneightreplicate INPG9 samplesto evaluate the reproducibility of these samples.

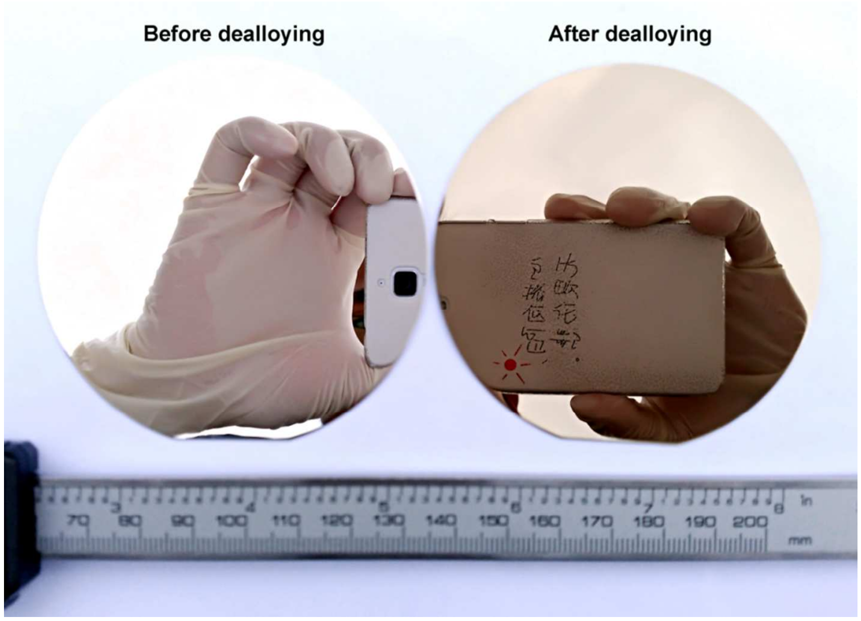

Figure S6. Photograph of the INPG9 fabricated on 3 inch wafers before and after dealloying shows a specular result. The as-deposited film appears a silver color, while it appears faint yellow after dealloying.

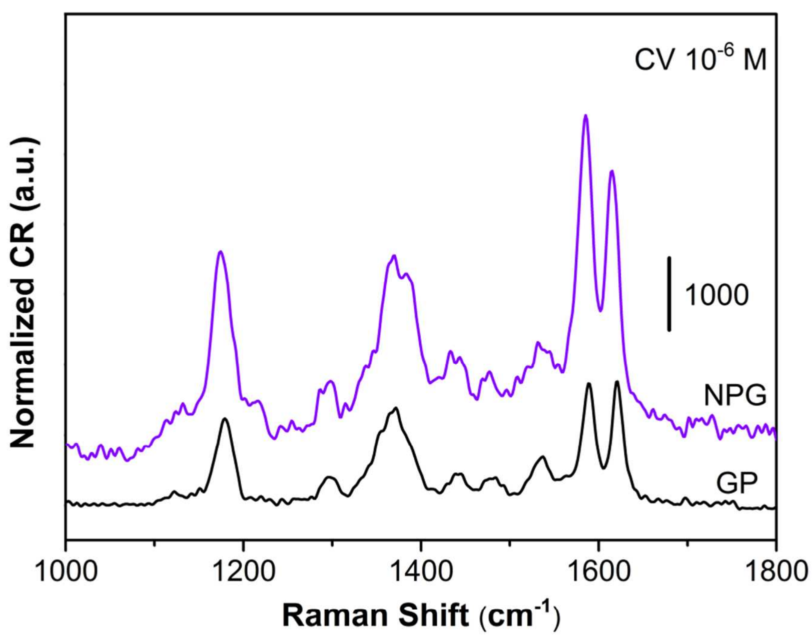

Figure S7. Comparison of SERS spectrabetween NPG and GPsubstrates with 10^{-6} M CVas the probe molecules. The GP was fabricated by dealloying $Au_{3.9}Ag_{96.1}$alloy precursor. The excitation wavelength is 514 nm.