Electronic Supplementary Material (ESI) for Physical Chemistry Chemical Physics.

Fabrication of transparent SERS platform via interface self-assembly of gold nanorods and gel trapping technique for on-site real time detection

Xiang Lin, [a] Wu Li Ji Hasi,*[a] Si-Qin-Gao-Wa Han,[b] Xiu Tao Lou, [a] Dian Yang Lin,* [a] Zhi Wei Lu* [a]

[a] *National Key Laboratory of Science and Technology on Tunable Laser, Harbin Institute of Technology Harbin150080, China;*

[b] *Affiliated Hospital of Inner Mongolia University for the Nationalities, Tongliao, 028007, Inner Mongolia, China.*

Supplementary Information

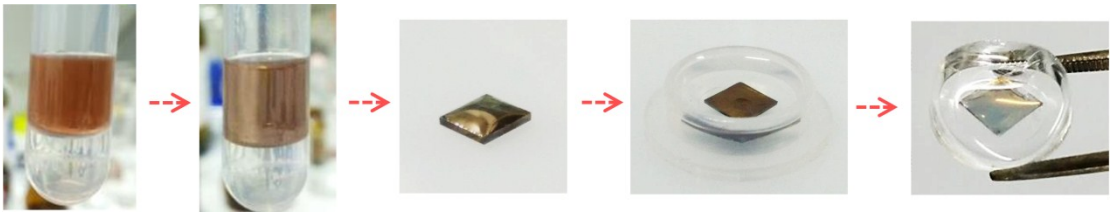

Figure S1 Digital images of the fabrication process of Au NRs PDMS substrate, corresponding to Scheme 1.

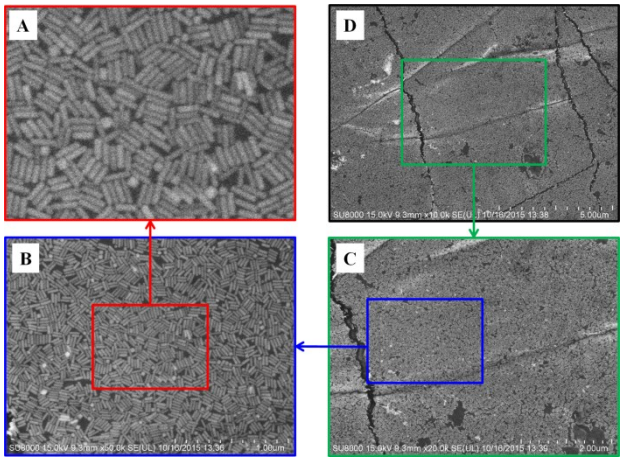

Figure S2 SEM images of Au NR PDMS film with different magnifications.

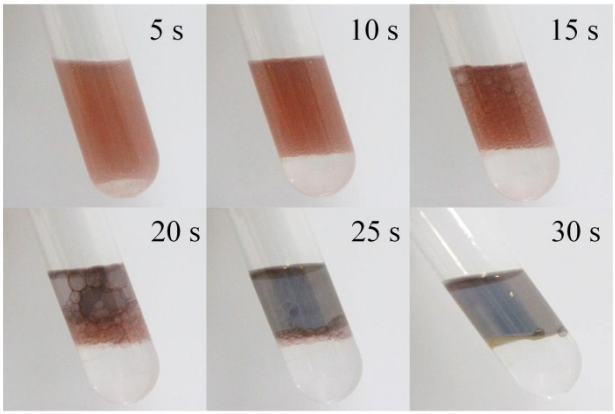

Figure S3 Digital images of the formation of metal-like liquid film under different time after vigorously shaking of the mixture of citrate stabilized Au nanorods solution and CH_2Cl_2.

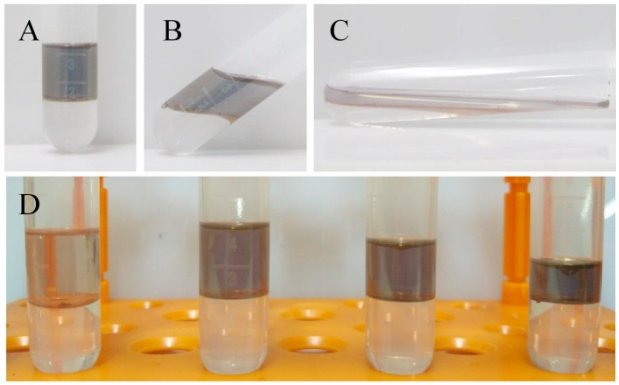

Figure S4 Digital images of the Au nanorod metal-like liquid film in teflon centrifuge tube under different angle (A-C) and Au nanorod concentration (D).

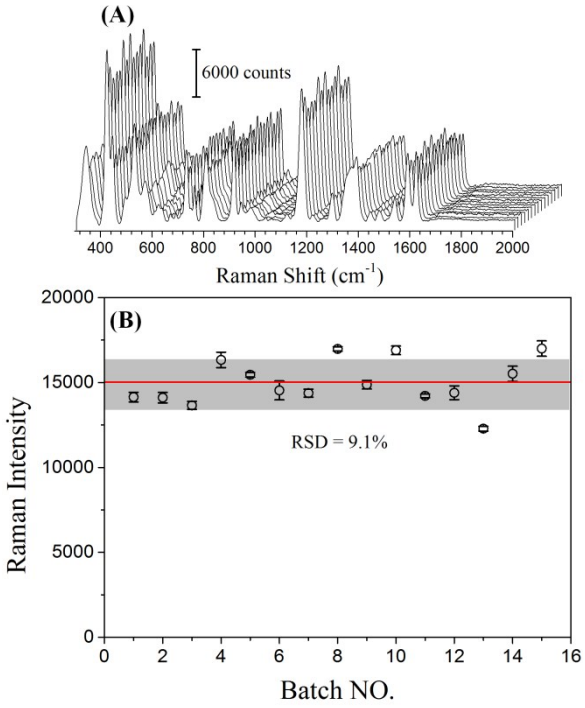

Figure S5. SERS spectra of CV (10^{-5} M) recorded from 15 batches of the Au NR PDMS platforms(A). The relative standard deviation of the absolute signal height at 1174 cm^{-1} is 9.1% (B). The laser power was 30 mW, and the acquisition time was 5 s. Each data point represents the average value from three SERS spectra. Error bars show the relative standard deviations.

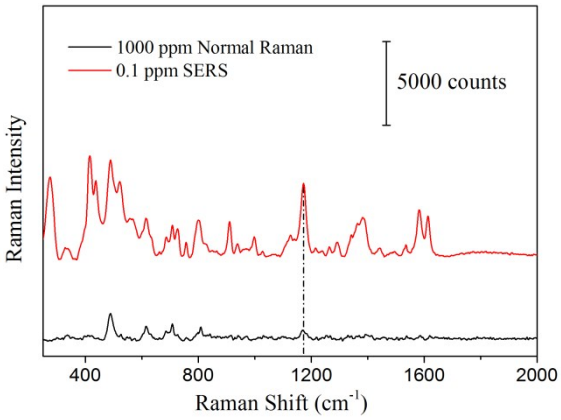

Figure S6. Normal Raman spectrum (1×10^{-3} g/mL) and SERS spectrum (0.1 ppm) of crystal violet. Normal Raman spectrum was collected from a PDMS platform without loading Au NRs.

In order to determine the analytical enhancement factor of Au NR PDMS substrate, normal Raman spectrum of 1×10^{-3} g/mL crystal violet aqueous solution and SERS spectrum of 0.1 ppm crystal violet aqueous solution using PDMS platform with and without loading Au NRs were recorded respectively (Figure S4). Analytical enhance factor (AEF) of SERS was calculated according to the following equation:

$$AEF = (I_{SERS}/I_{NR}) \times (C_{NR}/C_{SERS})$$

I_{SERS} is the intensity of the selected band at 1174 cm^{-1} obtained by SERS, I_{NR} is the corresponding band intensity of the normal Raman spectrum. C_{SERS} and C_{NR} are the concentrations in the SERS and normal Raman measurements, respectively. Based on the characteristic peaks at 1174 cm^{-1},

according to the equation, the AEF was calculated to be 0.87×10^5.