Electronic Supplementary Material (ESI) for Journal of Materials Chemistry C.

Electronic Supplemental Information

In situ SERS study of surface plasmon induced nitration on Ag@Polydopamine@Au structure

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ADDITIONAL FIGURES

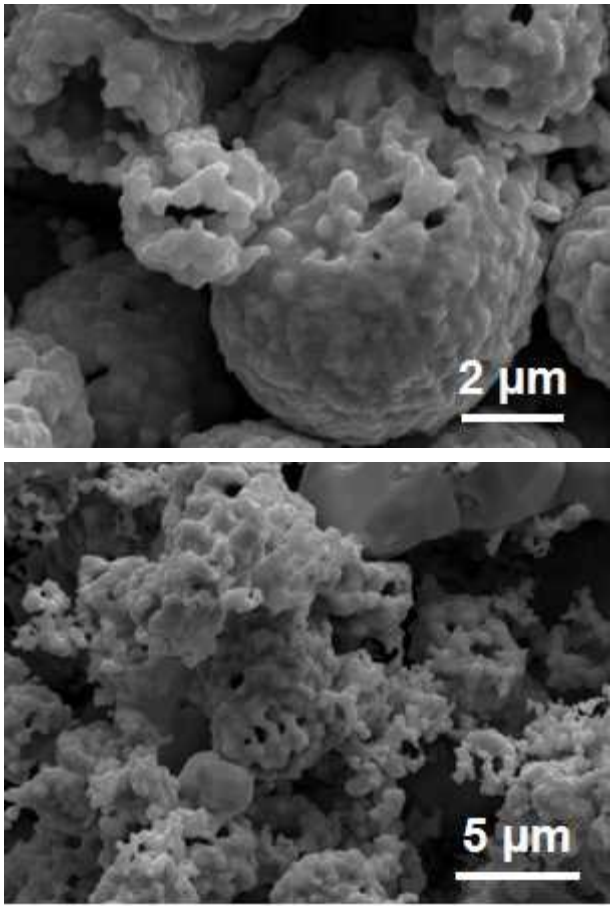

Fig. S1. SEM images of the Ag particles after direct reacting with $HAuCl_4$ for 10 min (up) and 30 min (down).

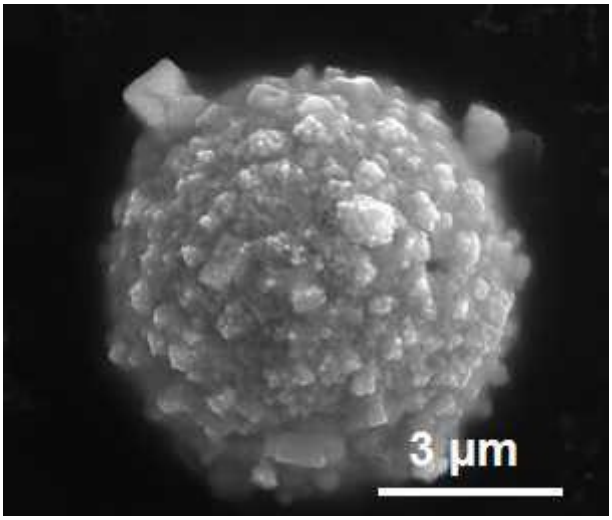

Fig. S2. SEM image of the Ag@PDA particles after reacting with $HAuCl_4$, before washing with ammonia solution.

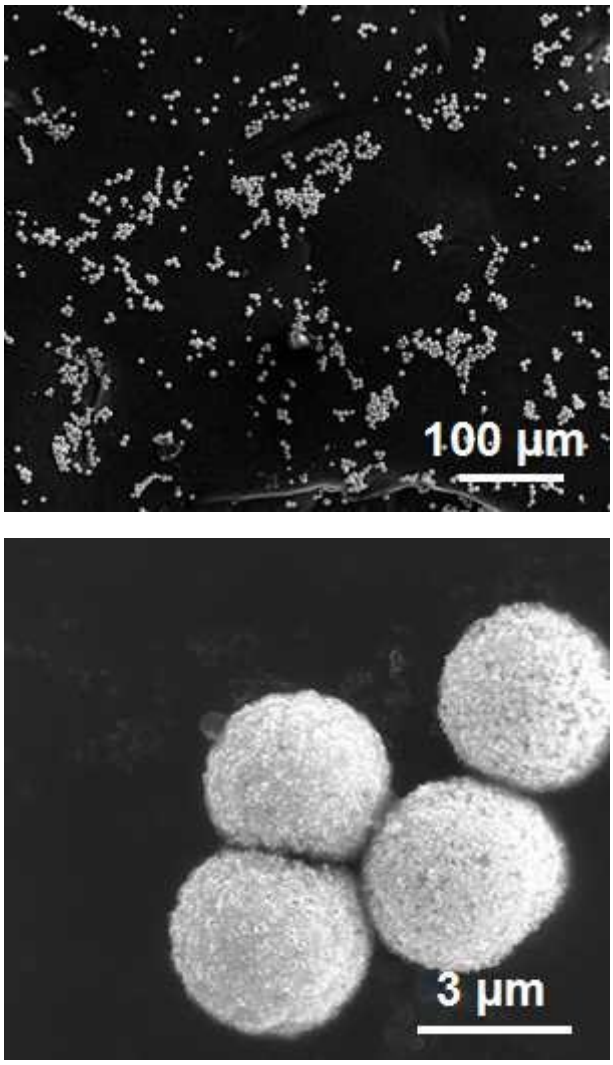

Fig. S3. SEM images of the as-prepared Ag@PDA@Au particles under different magnifications. These particles can be easily dispersed evenly on substrates, making the single particle SERS technique possible.

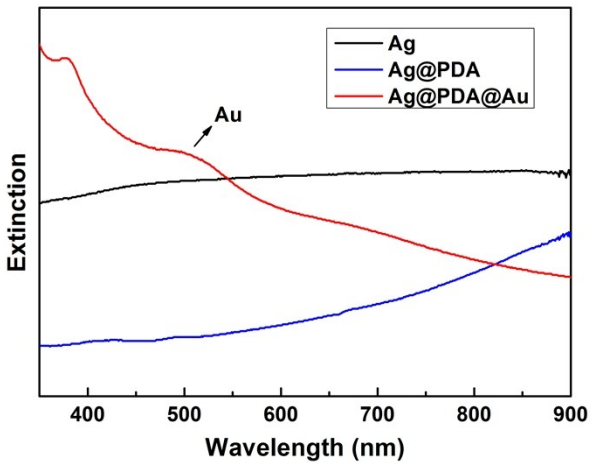

Fig. S4. Extinction spectra of Ag, Ag@PDA, and Ag@PDA@Au particles. The peak located around 510 nm indicates the successful decoration of 10-20 nm Au nanoparticles.

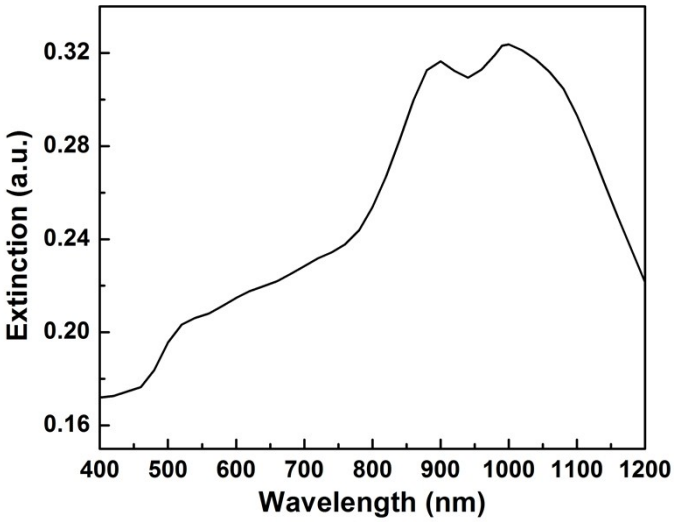

Fig. S5. Extinction spectrum of meatball-like Au particles in cyclohexane.

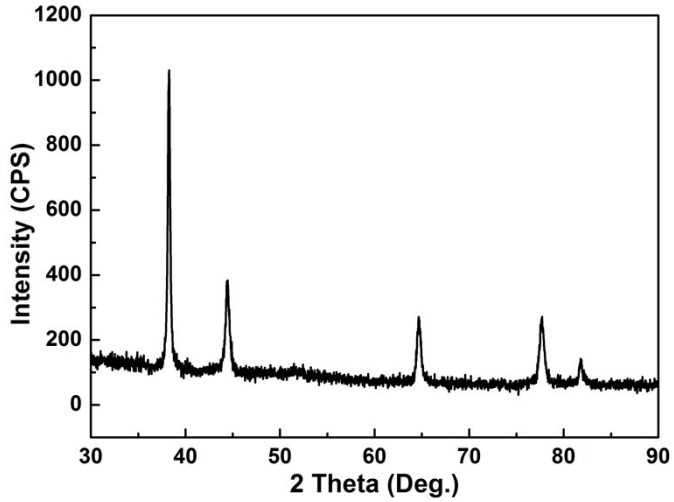

Fig. S6. XRD pattern of the as-prepared meatball-like Au particles.

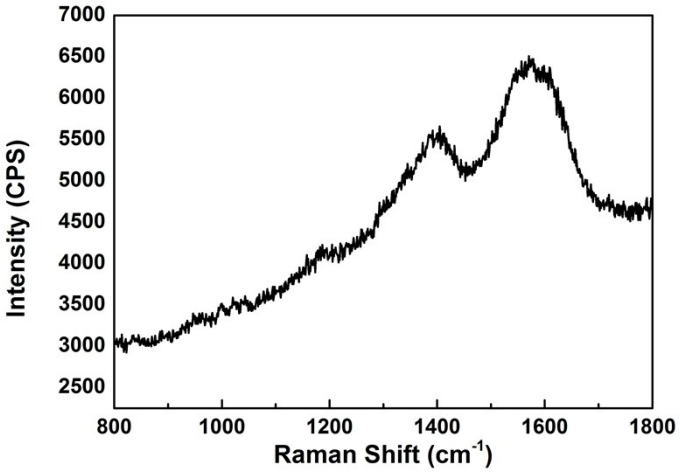

Fig. S7. SERS spectrum of 10^{-8} M benzenethiol (BT) on the as-prpeared Ag@PDA particles.

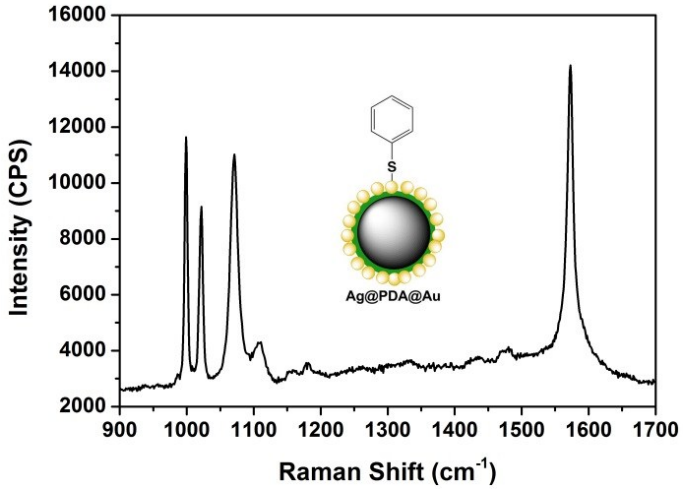

Fig. S8. SERS spectrum of 10^{-8} M benzenethiol (BT) on the as-prpeared Ag@PDA@Au particles.

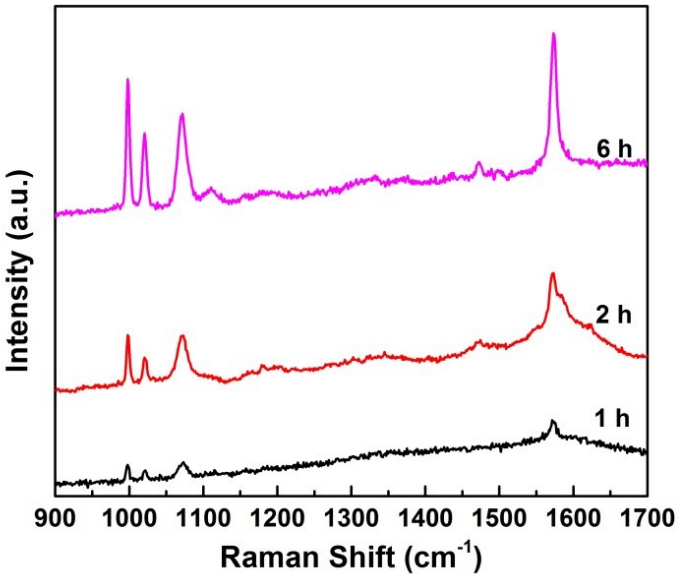

Fig. S9. SERS spectra of a mixture of benzenethiol (BT) and HNO_3 on the Ag@PDA@Au particles in dark for different time periods. It can be seen that no nitration (-NO_2 peak at 1330 cm^{-1}) happened in the dark environment.

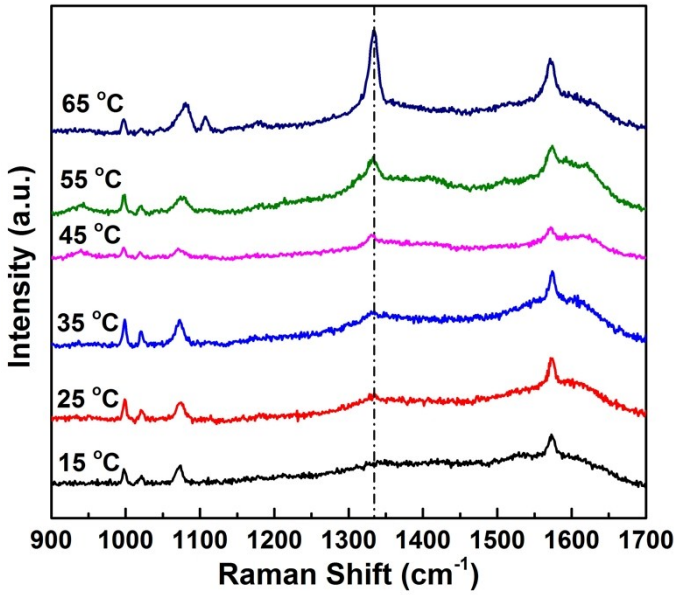

Fig. S10. SERS spectra obtained by heating a mixture of benzenethiol (BT) and HNO_3 with the presence of Ag@PDA@Au particles at different temperatures for 10 min.

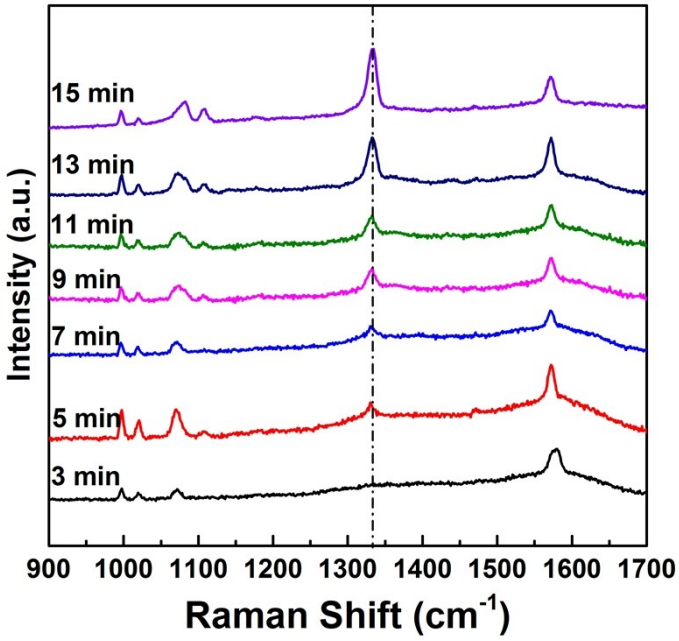

Fig. S11. SERS spectra obtained by heating a mixture of benzenethiol (BT) and HNO_3 with the presence of Ag@PDA@Au particles at 65 °C for different time periods.

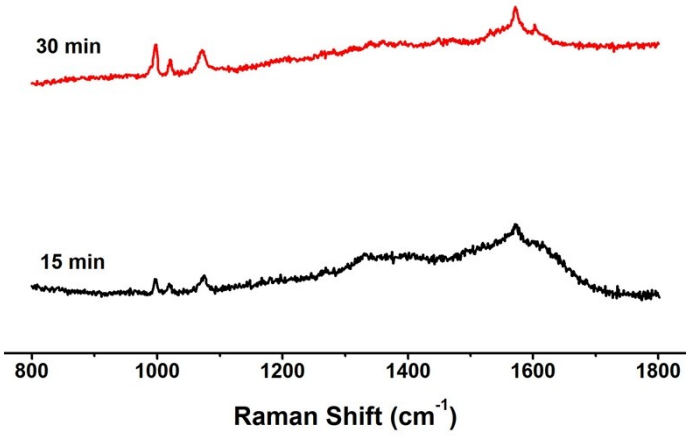

Fig. S12. SERS spectra obtained by heating a mixture of benzenethiol (BT) and HNO_3 without the presence of Ag@PDA@Au particles at 65 °C for different time periods.

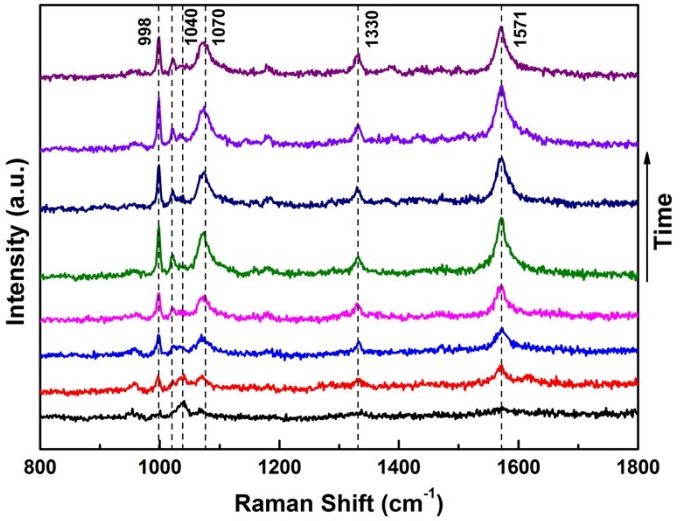

Fig. S13. Time-dependent SERS spectra showing the reaction of benzenethiol and nitric acid on a single Au hierarchical particle, with a laser wavelength of 633 nm and power of 54 μW. Spectra were recorded every 2 min under continuous laser irradiation.

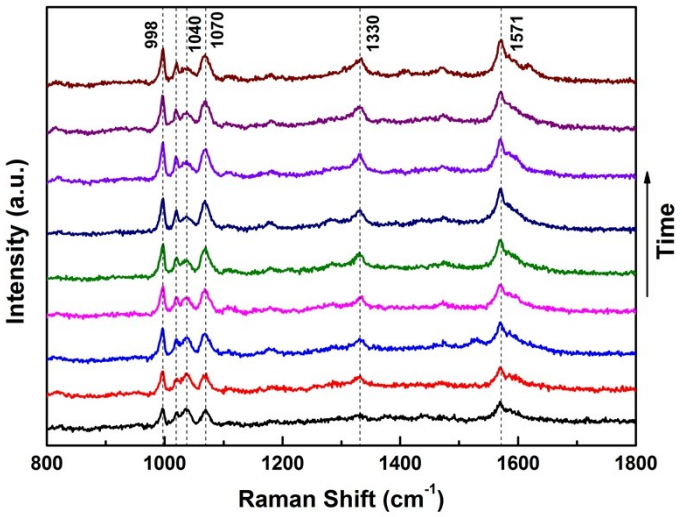

Fig. S14. Time-dependent SERS spectra showing the reaction of benzenethiol and nitric acid on a single Ag hierarchical particle, with a laser wavelength of 633 nm and power of 54 μW. Spectra were recorded every 5 min under continuous laser irradiation.