Electronic Supplementary Material (ESI) for Nanoscale Advances.

Supporting Information

Anti-Counterfeiting SERS Security Labels Derived from Silver Nanoparticles and Aryl Diazonium Salts

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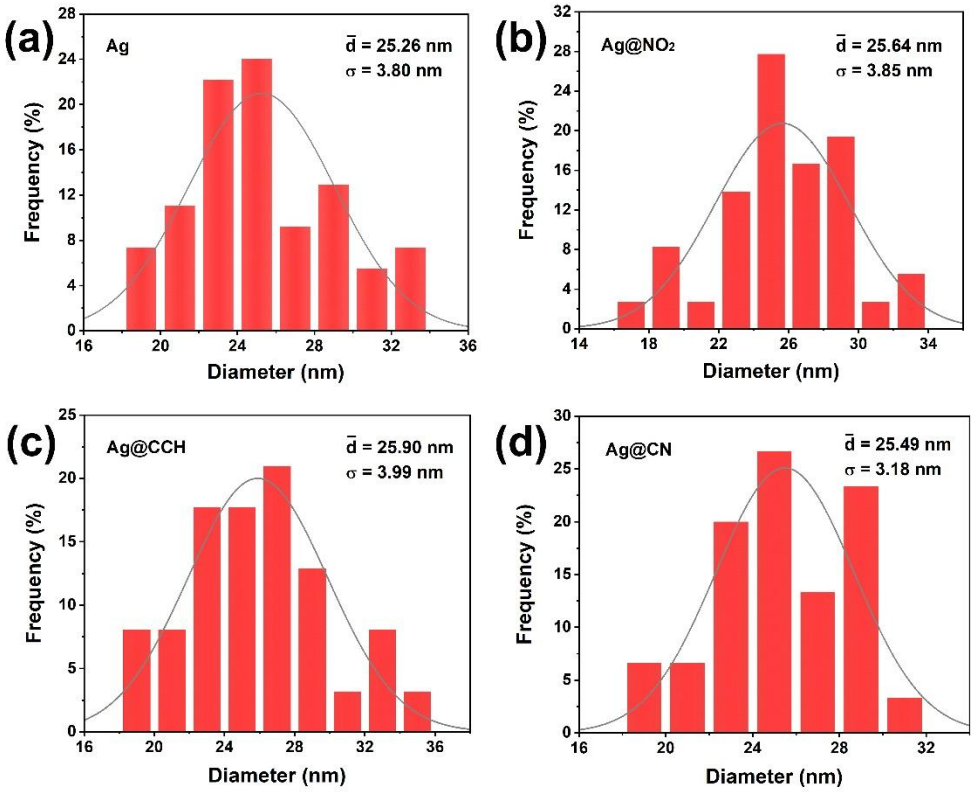

Fig. S1 Size distribution histograms measured from SEM images and associated distribution curves of (a) pristine Ag NPs, (b) Ag@NO_2, (c) Ag@CCH and (d) Ag@CN NPs.

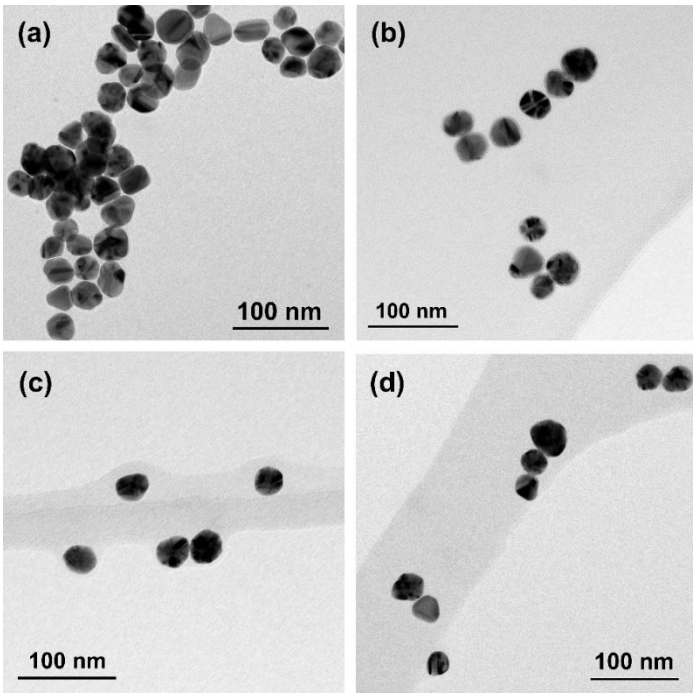

Fig. S2 TEM images of (a) pristine Ag NPs, (b) Ag@NO_2, (c) Ag@CCH and (d) Ag@CN NPs.

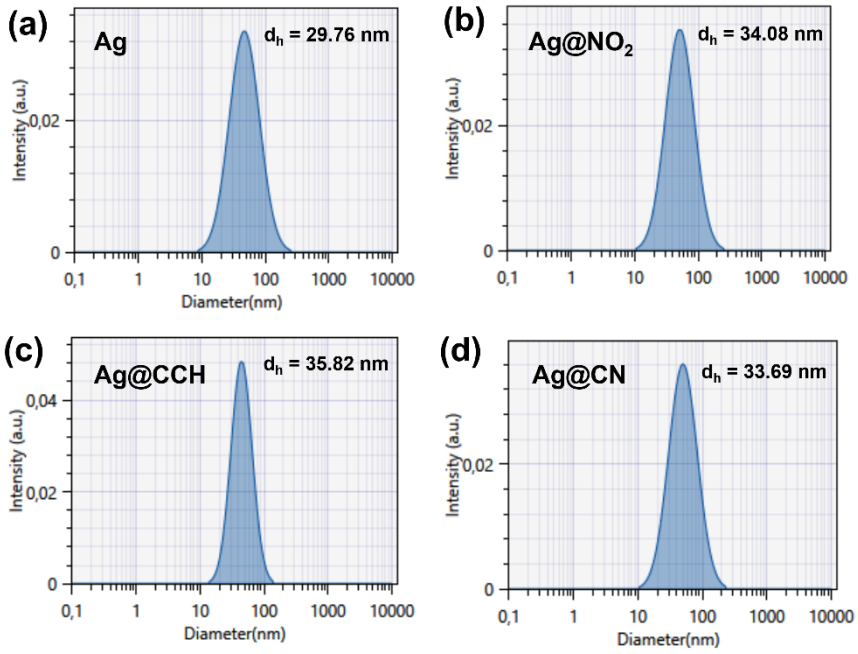

Fig. S3 The hydrodynamic size (d_h) from DLS measurements for (a) Ag, (b) Ag@NO_2, (c) Ag@CCH and (d) Ag@CN NPs.

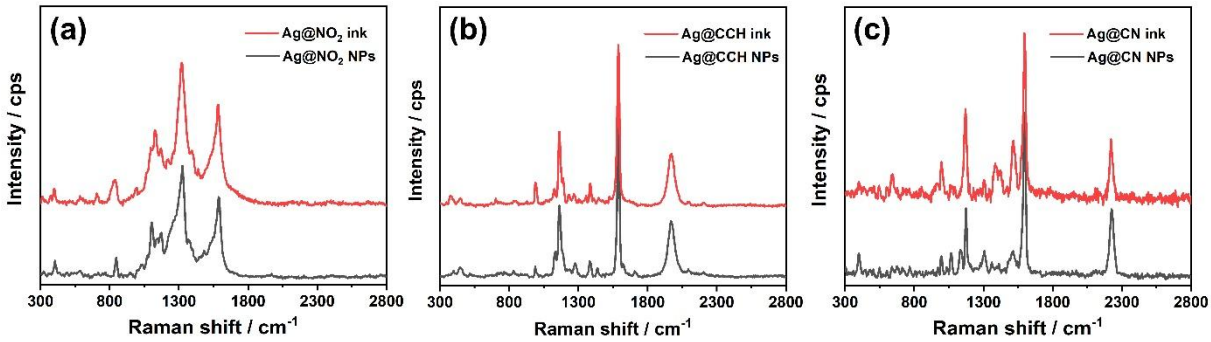

Fig. S4 SERS signals of (a) $Ag@NO_2$, (b) Ag@CCH and (c) Ag@CN before (black curves) and after dispersion in the inks (red curves).

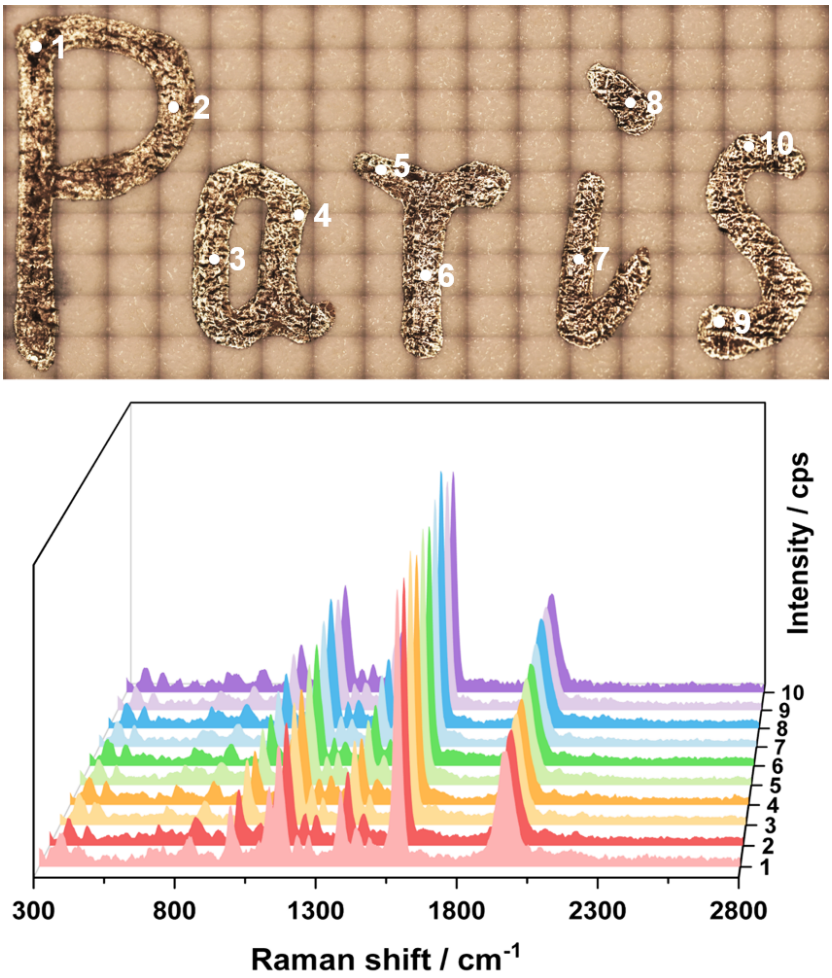

Fig. S5 SERS spectra collected from different spots of the handwritten word “Paris” (using Ag@CCH ink).

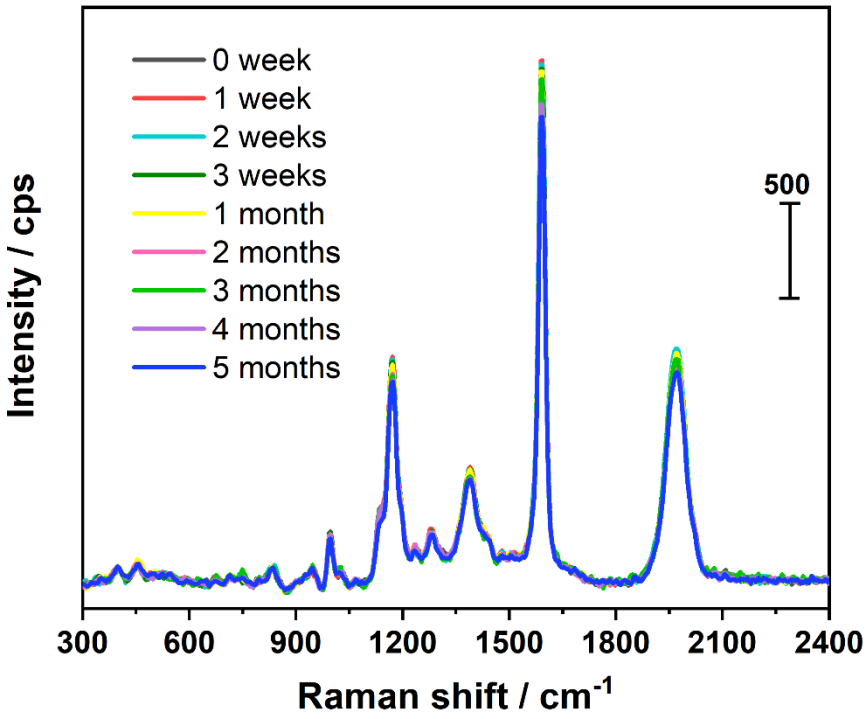

Fig. S6 Stability over time of Ag@CCH ink within 5 months.

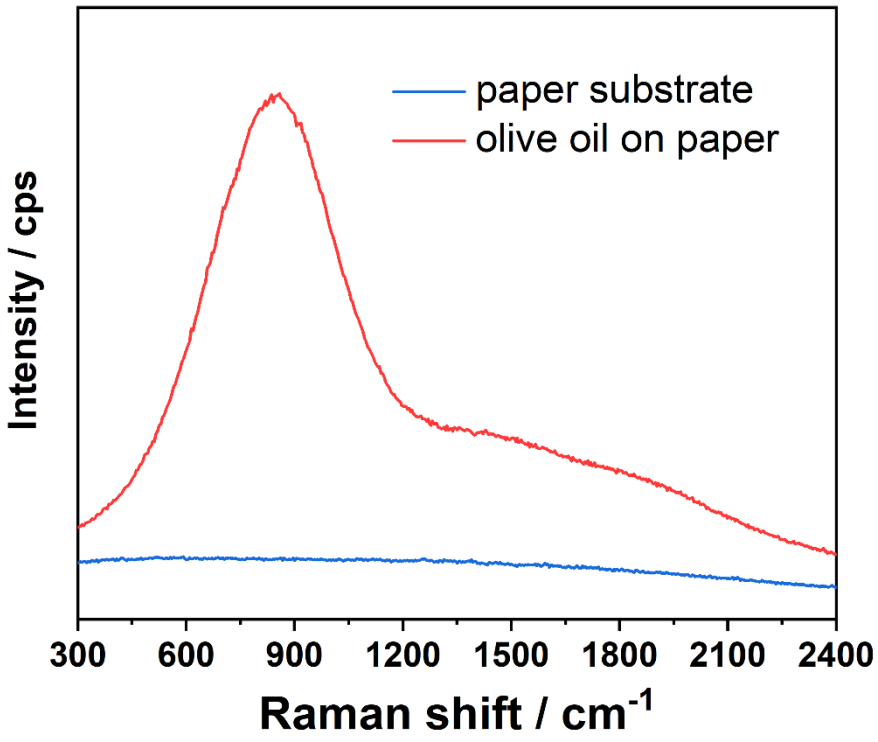

Fig. S7 Raman spectra of olive oil and the paper substrate under excitation of 638 nm laser.

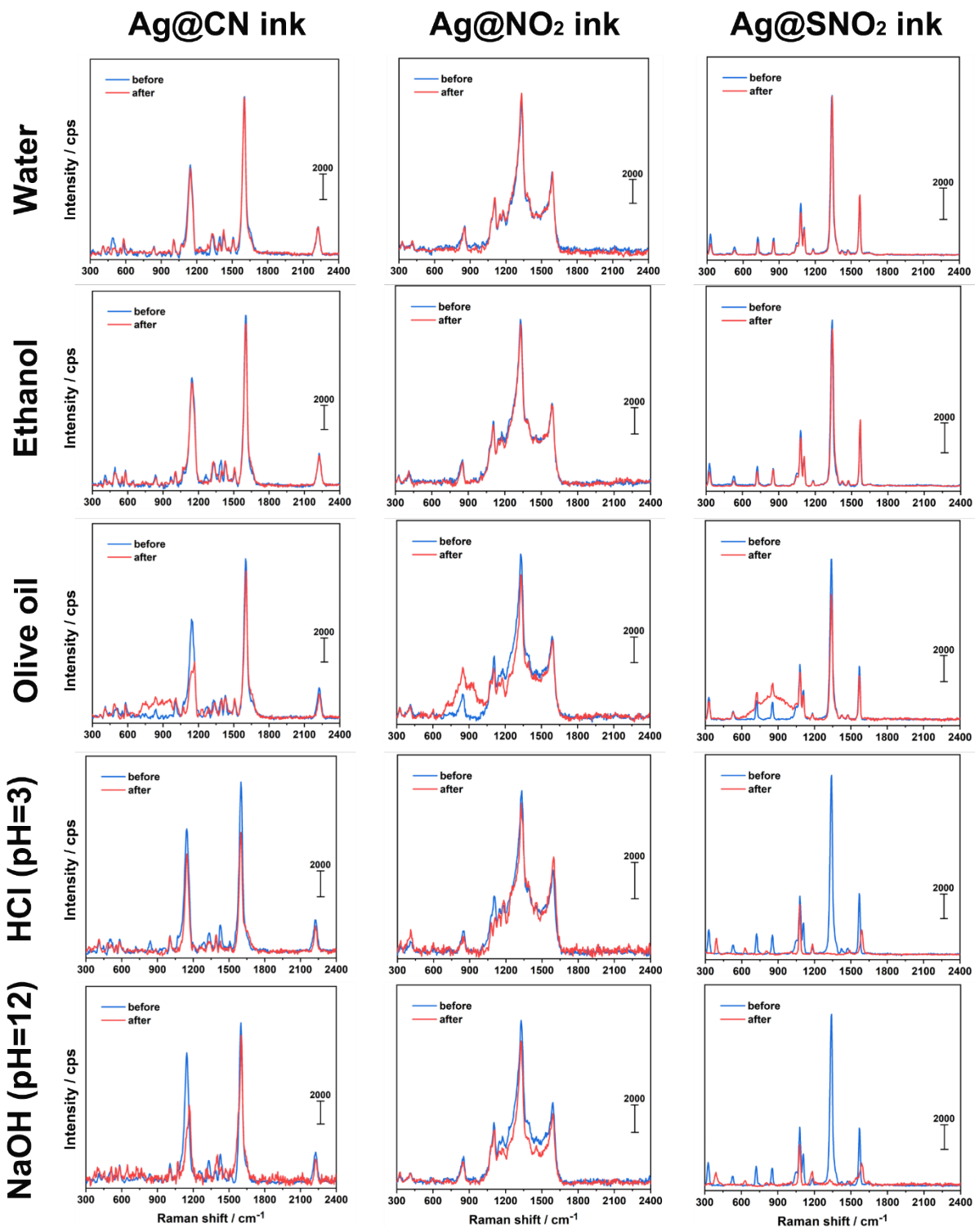

Fig. S8 Investigation of the stability of Ag@CN, Ag@NO_2 and Ag@SNO_2 ink in different medium. The testing method is same to that of Ag@CCH ink illustrated in maintext.

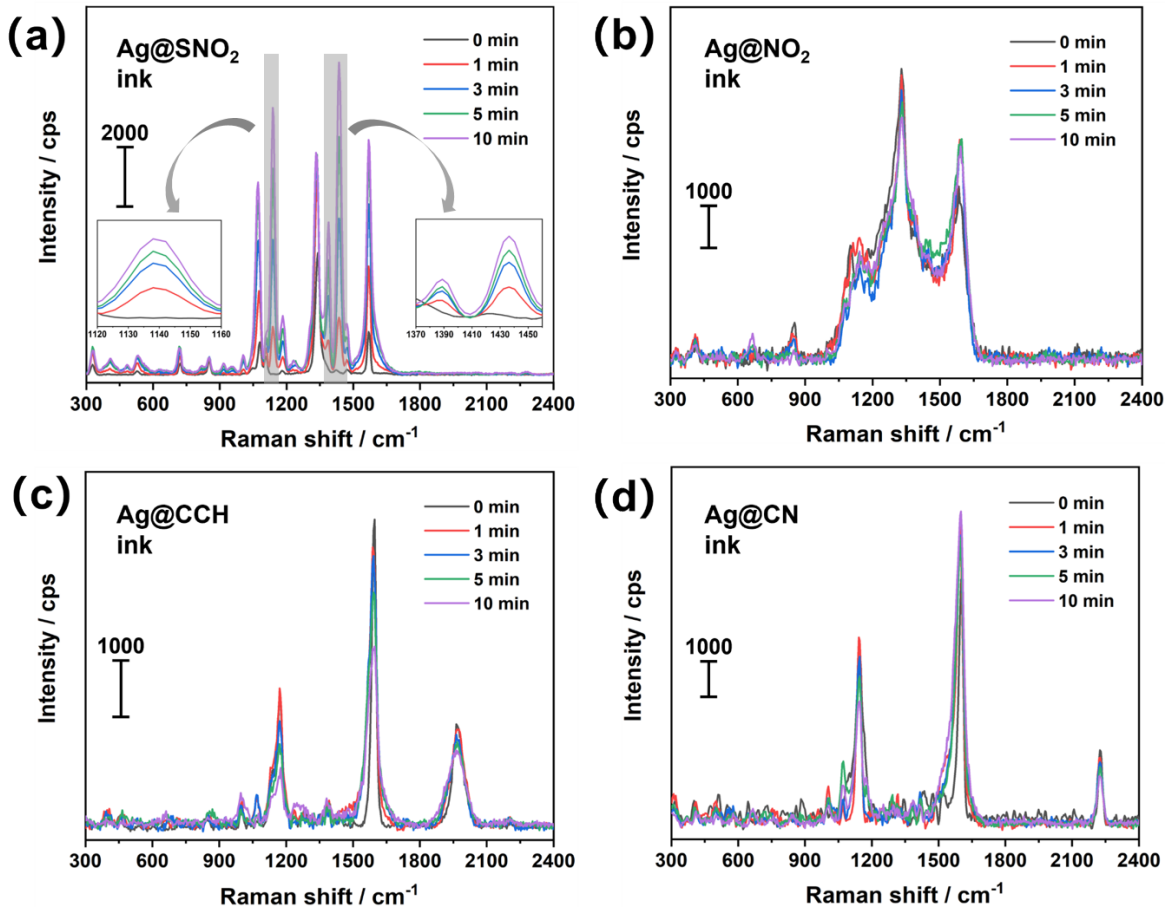

Figure S9. SERS spectra of (a) $Ag@SNO_2$, (b) $Ag@NO_2$, (c) Ag@CCH and (d) Ag@CN inks under laser irradiation for 0, 1, 3, 5 and 10 minutes, using 638 nm laser (10 mW) with objective 10x. The insets of Fig. (a) display a zoom of the time evolution of the peaks located in the shaded regions.