Supporting Information for

Fork-shaped Paper SERS Sensor Coated with Raspberry-like Bimetal Nanospheres for Boosted Mixture Detection: Experimental Design and Application

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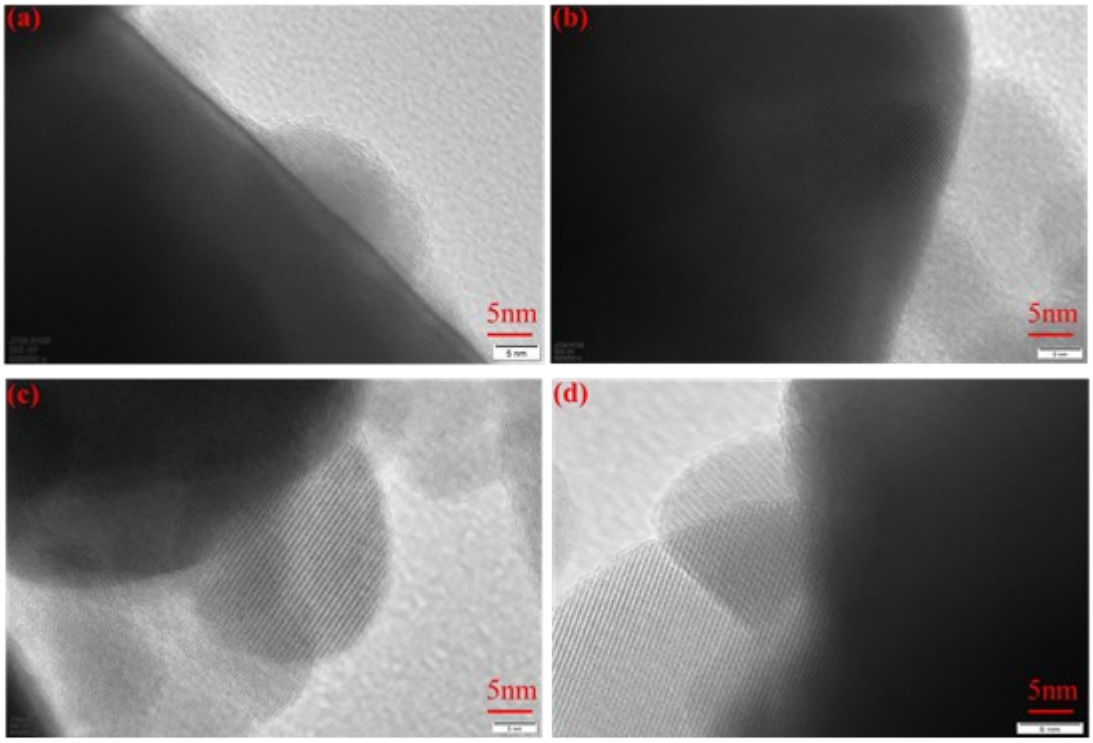

Fig. S1. High resolution TEM images of raspberry-like bimetal Au@AgNPs.

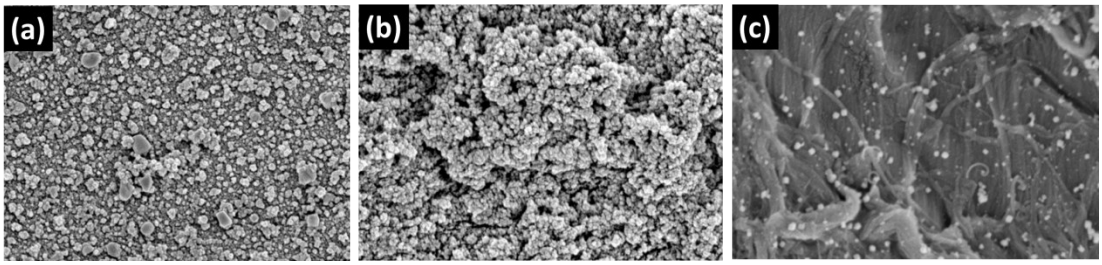

Fig. S2. SEM images of AgNPs/paper substrates obtained by growth solution of different concentration (a) 0.04M and (c) 0.01M. (b) SEM images of AgNPs/paper (Fig. S2a) after exposing to the $HAuCl_4$ solution.

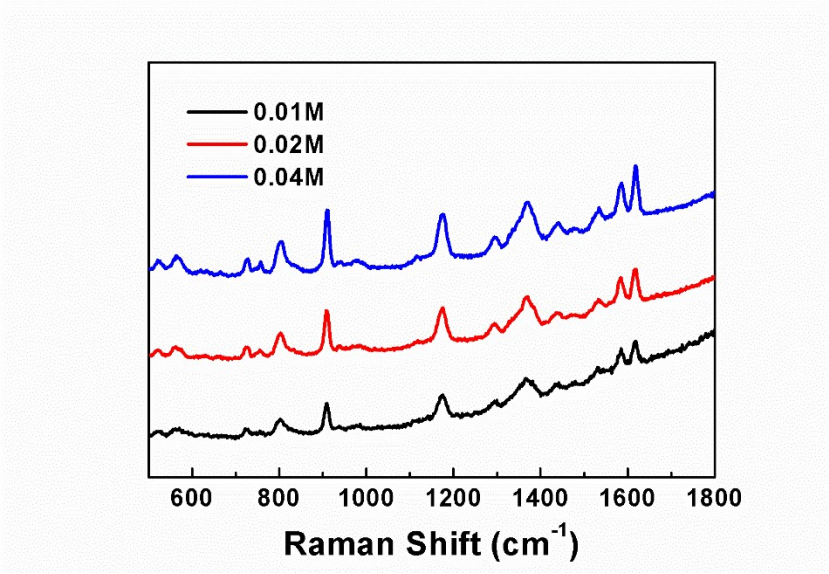

Fig. S3. The Raman spectra of 10^{-7} M CV on different AgNPs/paper substrates.

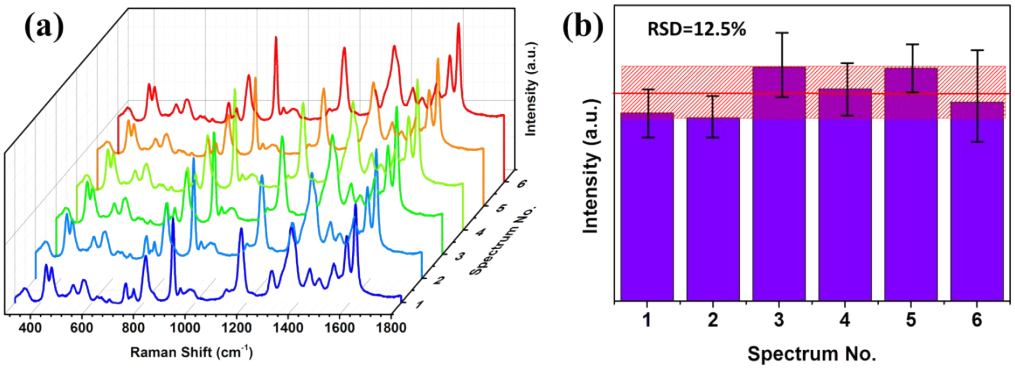

Fig. S4. (a) SERS signals of CV molecules at 10^{-8} M from 6 different batches paper substrates. (b) Intensity distribution of the peak at 914 cm^{-1}.

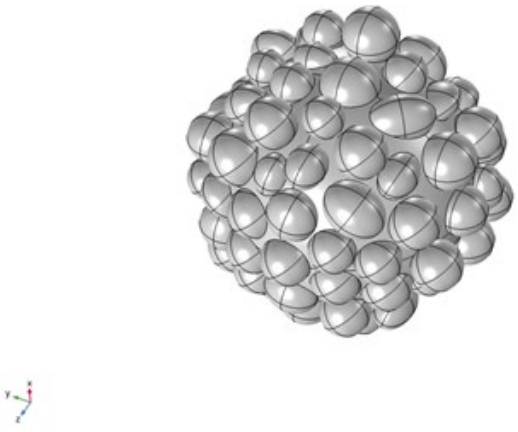

Fig. S5. Model of Raspberry-like bimetal Au@AgNP used in the COMSOL software according to its SEM images.

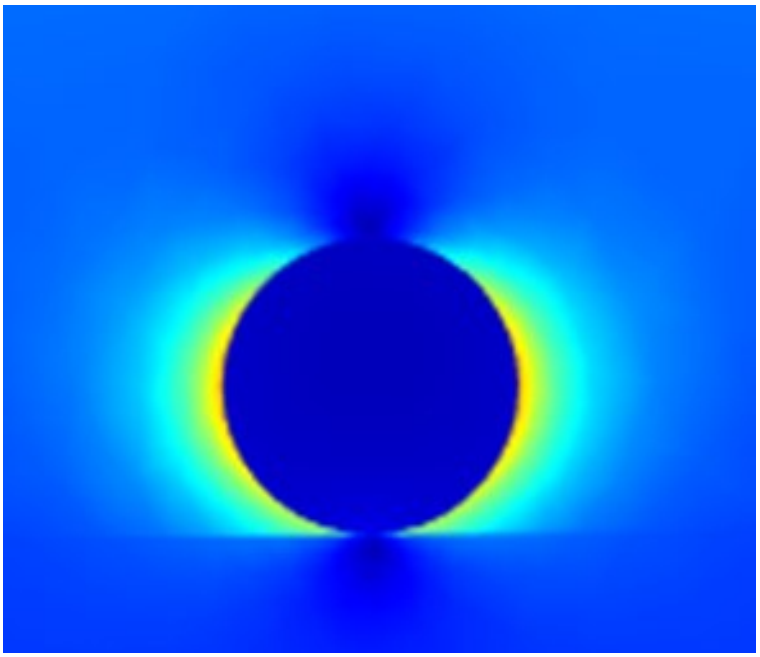

Fig. S6. The electric field distribution on the AgNP.

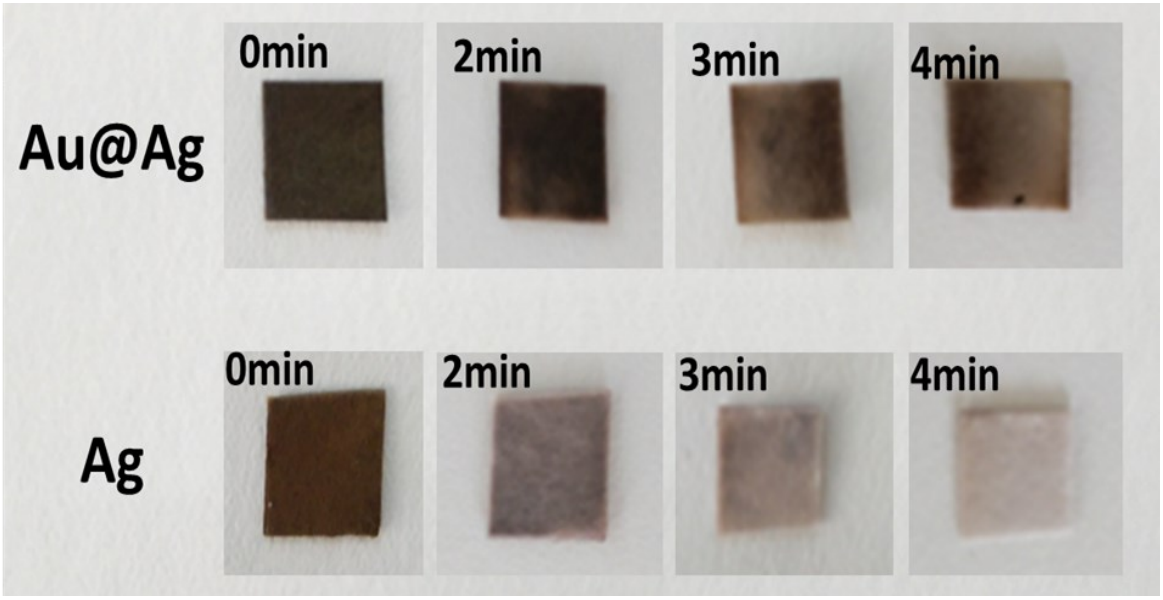

Fig. S7. Optical photos of both paper substrates after immersing in aqueous H_2O_2 for different time.

Table S1. The limit of detections for different mixtures reached in the SERS paper substrates combined paper chromatography.

Substrates	Analytes	LOD	Reference
Ag@SiO_2paper	R6G and malachite green	0.5 mM and 0.5 mM	Ref. 1
Ag nanoislands/paper	CR,TB and CV	50 mM, 40 mM and 5 mM	Ref. 2
AuNP/MoS_2/filter paper	CV and TB	10^{-8} M and 10^{-8} M	Ref. 3
AgNPs/paper	R6G, methylene blue and malachite green	1 mM, 1 mM and 1 mM	Ref. 4
AgNPs /filter paper	R6G, CR, CV and MO	4×10^{-4} M, 4×10^{-4} M, 4×10^{-4} M and 4×10^{-4} M	Ref. 5
ZnO/AgNPs/paper	Dimethoate and thiuram	54.57 μg/L and 19.16 μg/L	Ref. 6
Raspberry-like bimetal Au@AgNPs/paper	CV and fluorescein	10^{-9} M and 10^{-9} M	This work

References:

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