Supplementary Information

Co-Assembly of Au nanorods with Ag nanowires within polymer nanofiber matrix for enhanced SERS property by electrospinning

Chuan-Ling Zhang, Kong-Peng Lv, Hai-Tao Huang, Huai-Ping Cong, Shu-Hong Yu*

Address: Division of Nanomaterials & Chemistry, Hefei National Laboratory for Physical Sciences at Microscale, Department of Chemistry, Department of Chemical Physics, University of Science and Technology of China, Hefei 230026, P. R. China

Email: shyu@ustc.edu.cn

**Fig. S1** Low-magnification TEM image of AuNRs-AgNWs nanocomposites with AuNRs concentration of 40 nM.

**Fig. S2** SEM images of the AuNRs-AgNWs nanocomposites with AuNRs concentration of (a) 0 nM, (b) 10 nM, (c) 20 nM, and (d) 40 nM, respectively.
**Fig. S3** UV-Vis-NIR spectra of AuNR-AgNW nanocomposites aqueous solution with different AuNRs concentrations.

**Fig. S4** UV-vis transmittance spectra (a) and transmission spectra (b) of the electrospun film obtained at normal incidence with polarization angles of 0° and 90°, respectively.

**Fig. S5** High magnification TEM images of AuNRs-AgNWs/PVA electrospun nanofibers with AuNRs concentration of 40 nM. (a) One single AuNRs-AgNWs assemblies were assembled within a polymer fiber. (b) Two AuNRs-AgNWs nanocomposites were assembled within a polymer fiber at the same time.
**Fig. S6** Backscattering SEM images of the arranged AuNRs-AgNWs/PVA electrospun nanofibers with different AuNRs concentrations of (a) 0 nM, (b) 10 nM, (c) 20 nM, and (d) 40 nM, respectively.

**Fig. S7** UV-Vis-NIR spectra of (a) AuNRs/PVA electrospun mat with AuNRs concentration of 40 nM, and (b) PVA electrospun mat.

**Fig. S8** Chemical structure of DTTCI.
Fig. S9 SERS spectra of $10^{-7}$ M DTTCI molecules adsorbed on electrospun fibers containing AuNR-AgNW nanocomposites with AuNRs concentration of 40 nM. The electrospinning time is 1 h and acquisition time is 3 s.

Fig. S10 (a) SERS spectra of AuNRs-AgNWs/PVA electrospun mat without DTTCI molecules, the electrospinning time is 1 h and the concentration of AuNRs is 40 nM. (b) SERS spectra of ethanol solution containing $10^{-4}$ M DTTCI molecules. The acquisition time is 3 s.

Fig. S11 SEM images of the cross-section of electrospun mats. (a) and (b) have the same electrospinning time of 1 h, but different AuNRs concentrations (10 nM and 40 nM, respectively), while (b) and (c) have the same AuNRs concentration, but different electrospun time (1 h and 2 h, respectively). All these samples have the same AgNWs concentration (4 mg/mL in the electrospun solution).
**Fig. S12** SERS spectra of $10^{-4}$ M DTTCI molecules adsorbed on (a) AuNRs-AgNWs/PVA electrospun mat with AuNRs concentration of 10 nM, and (b) corresponding AuNRs-AgNWs/PVA cast film, the electrospinning time is 1 h and the concentration of AuNRs is 10 nM. The acquisition time is 3 s.