Electronic Supplementary Material (ESI) for Inorganic Chemistry Frontiers.

Supporting Information

Two-Dimensional Active Surface Growth in Ag Nanoplates

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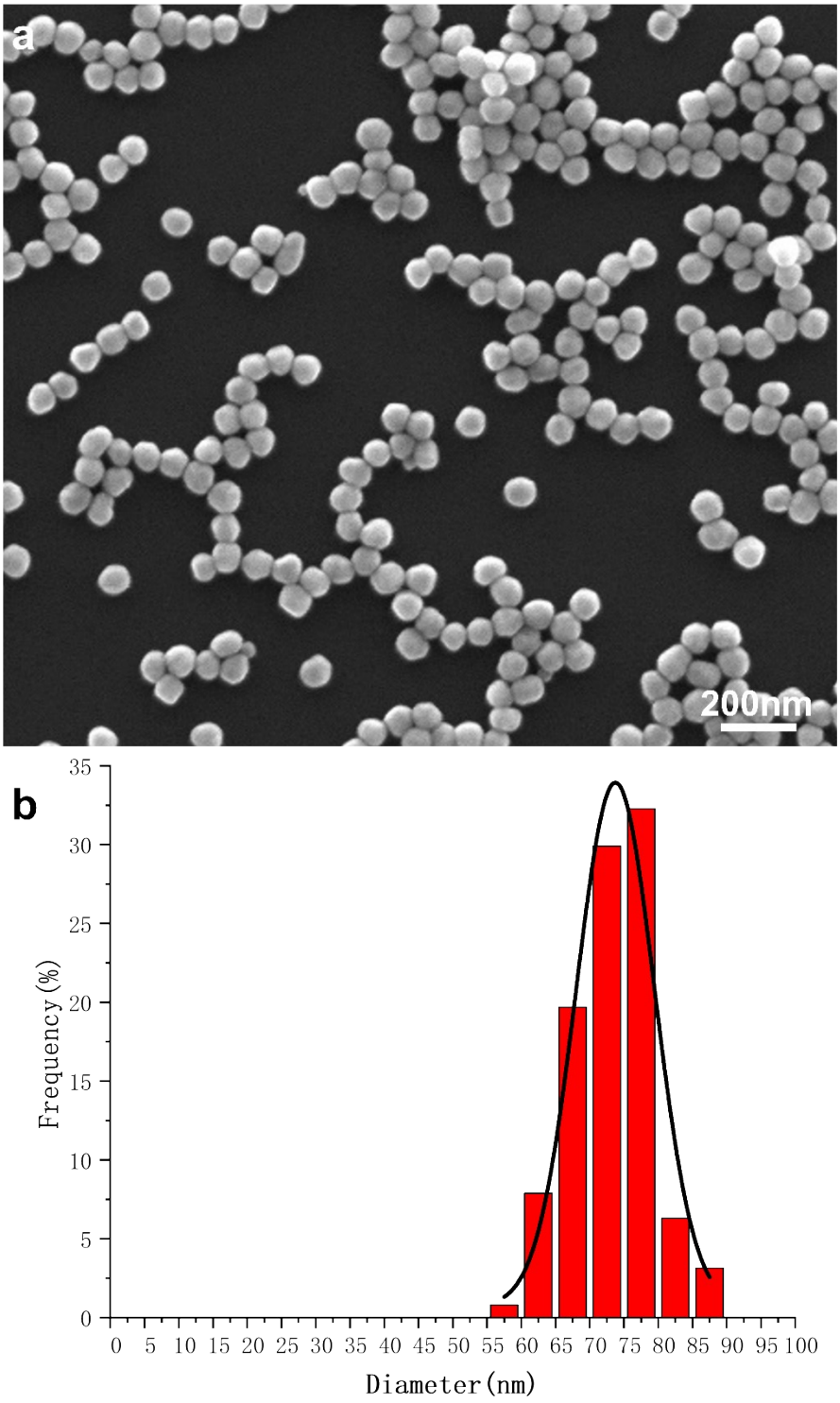

Fig. S1. (a) TEM image and (b) diameter distribution of 70 nm Au seeds.

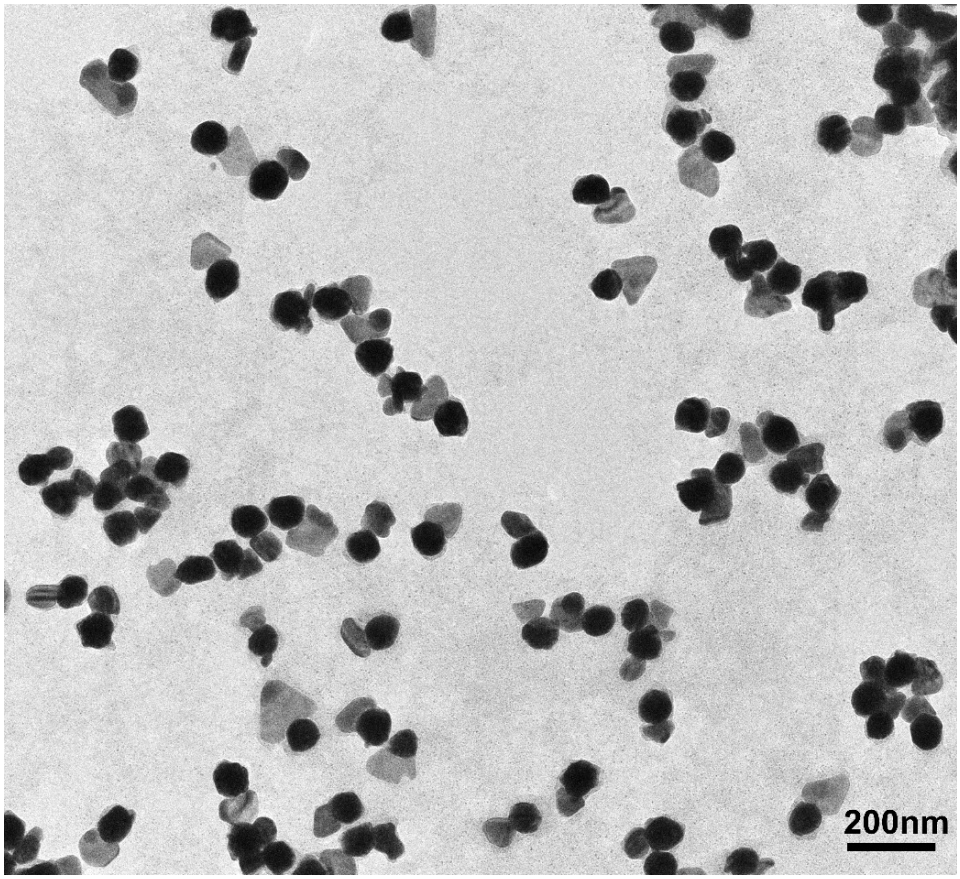

Fig. S2. TEM image of Au-Ag plate dimer structure similar to that in Fig. 1b without PSPAA encapsulation.

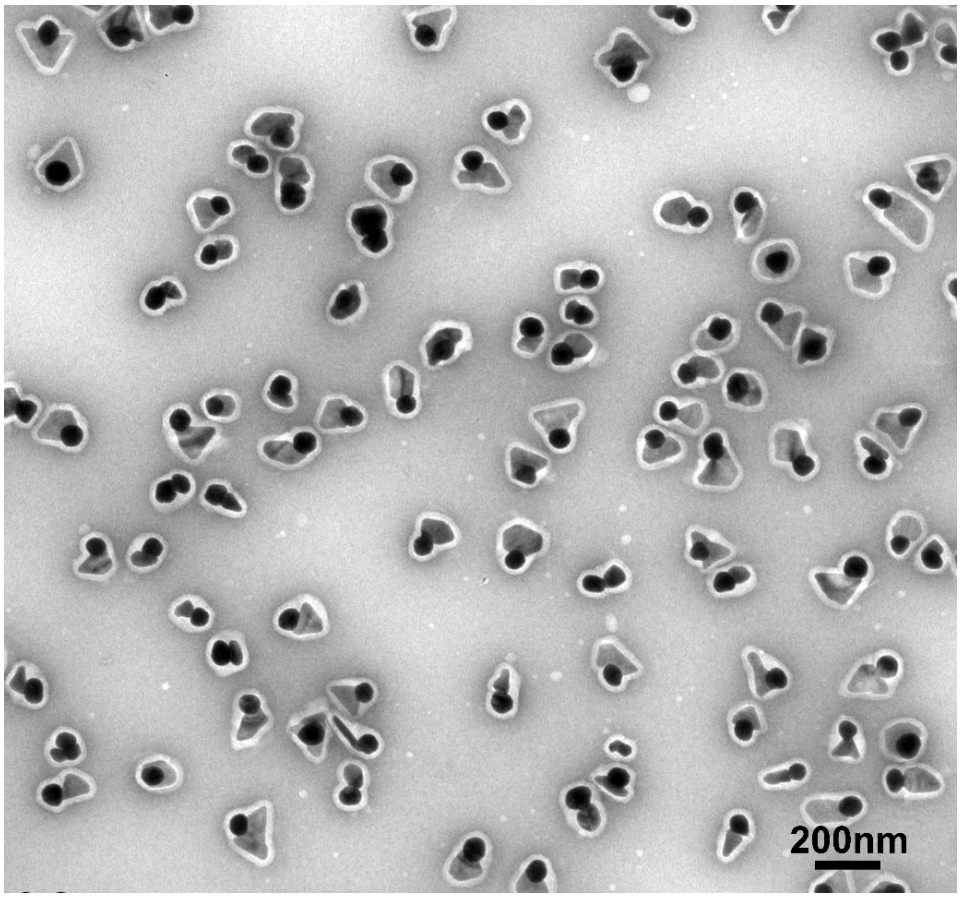

Fig. S3. TEM image of Au-Ag plate hybrid structure used for the purity survey: among the 104 nanoparticles, 99 are Au sphere-Ag plate dimers.

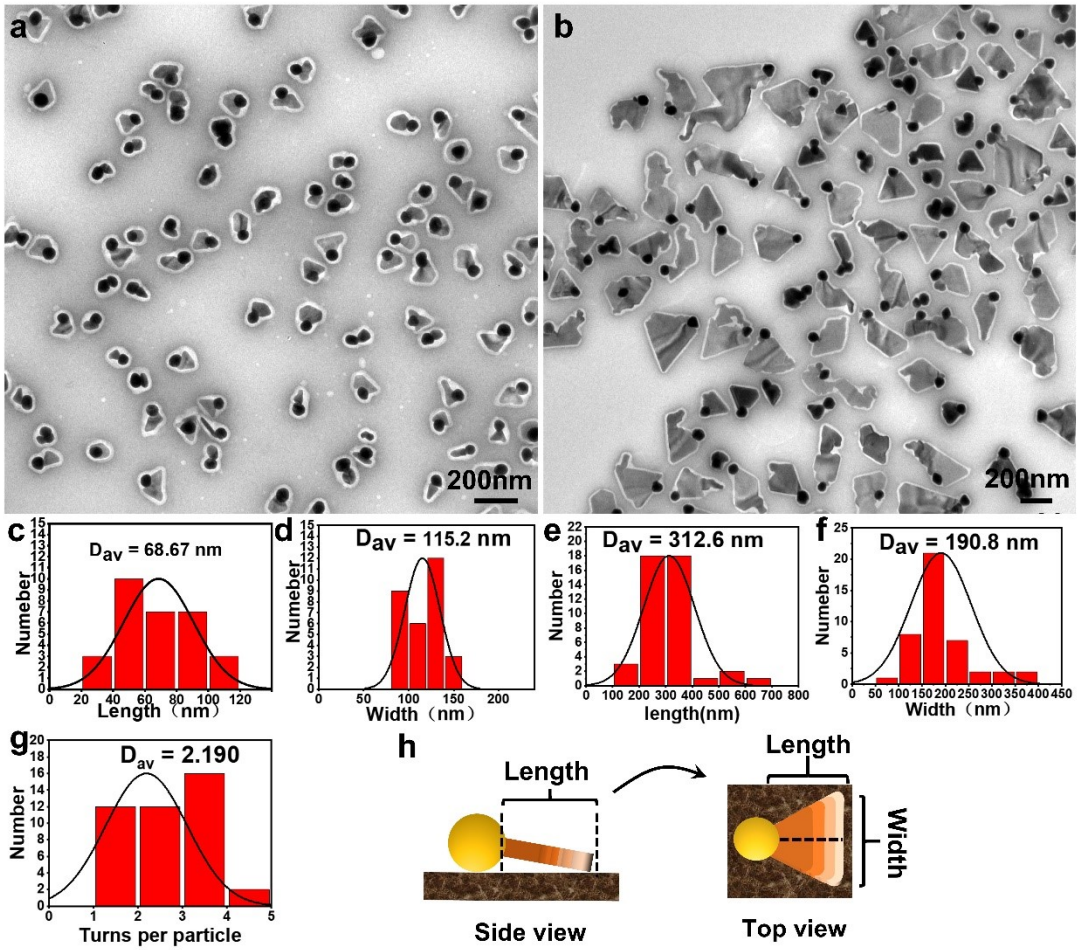

Fig. S4. TEM images of the (a) Au-Ag triangle plate and (b) Au-Ag plate heterostructures. The statistic distribution of the (c) length and (d) width of the Ag nanoplates in Au-Ag triangle plate and (e) length and (f) width of the Ag nanoplates in Au-Ag plate heterostructures. (g) The statistics of the number of turns per Ag nanoplates in Au-Ag plate heterostructures in b. (h) The schematic illustration of the measurement of the length and width of Ag nanoplate in Au-Ag plate heterostructures.

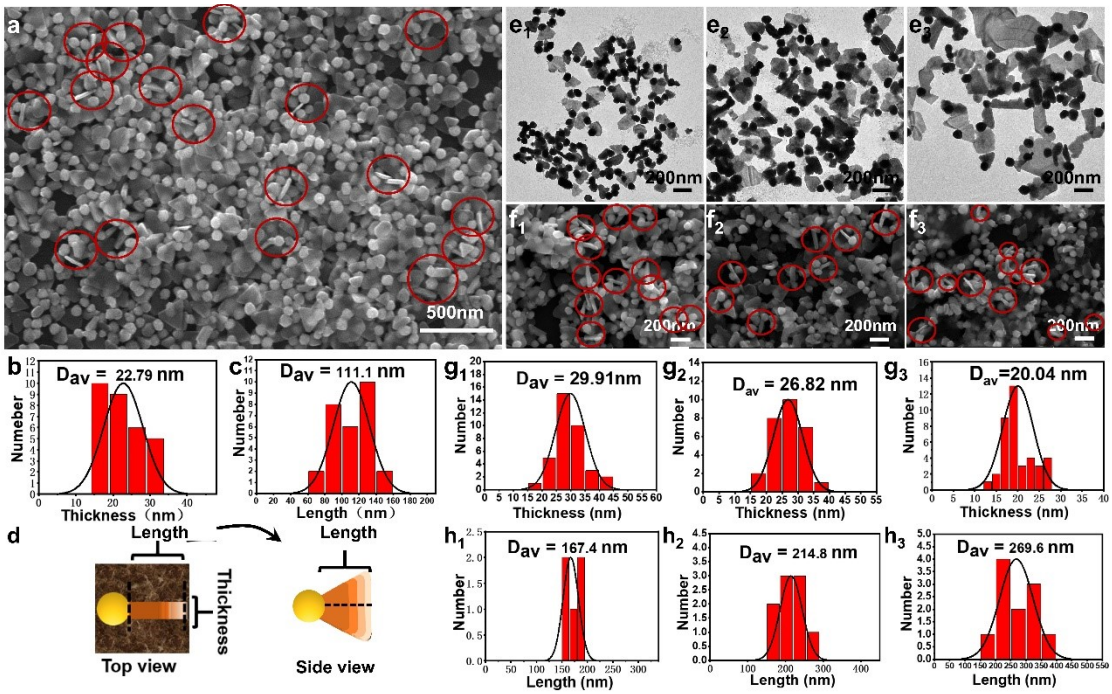

Fig. S5. (a) SEM image and the statistic distribution of the (b) thickness and (c) length of the Au-Ag triangle plate nanostructure. (d) The schematic illustration of the measured thickness and length of the Ag nanoplate in Au-Ag triangle plate heterostructures. (e) TEM images of the Au-Ag plate heterostructures synthesized at different concentration of MBIA ligand: (1) 0.10 mM; (2) 0.15 mM; (3) 0.20 mM. (f) SEM images with concentrated Au-Ag plate nanoparticles and the statistic average (g) thickness and (h) length of the Ag nanoplates in Au-Ag plate heterostructures.

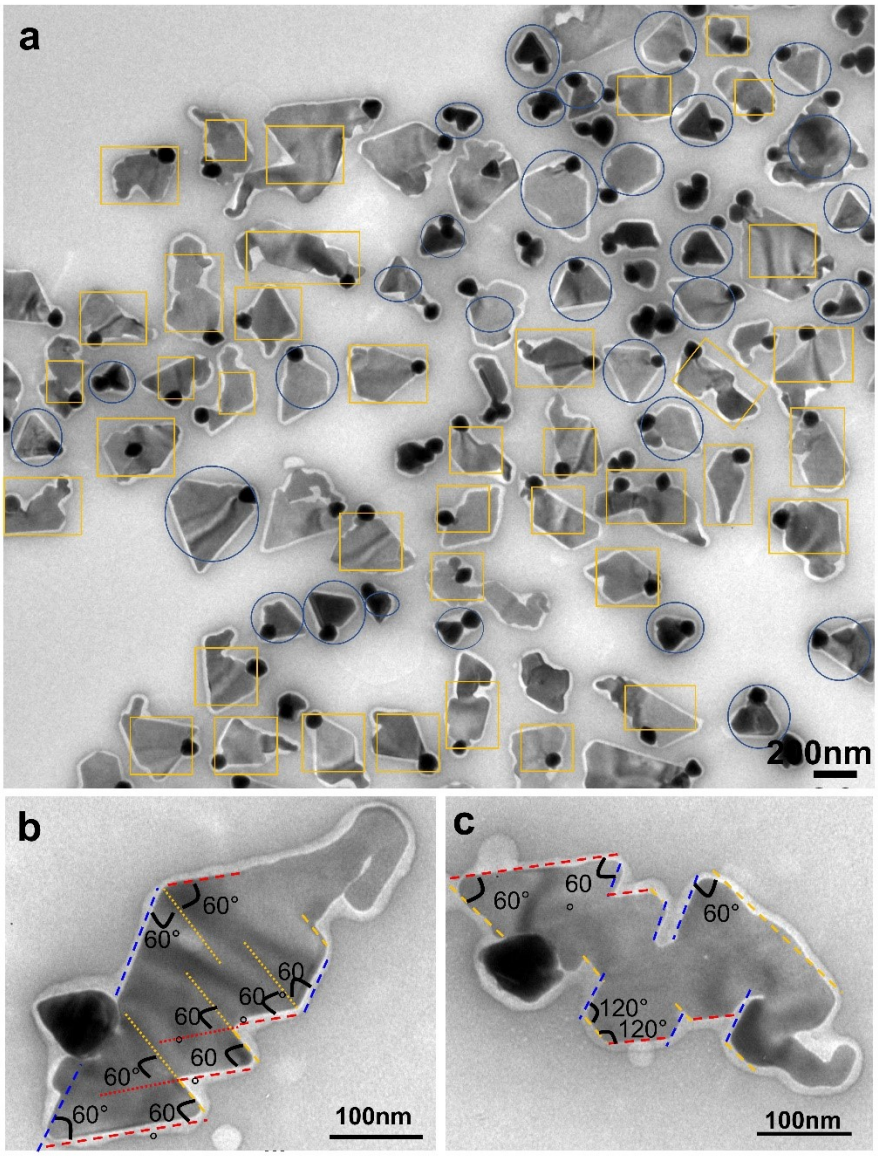

Fig. S6. (a) TEM image of Au-Ag plate hybrids in which the two types of structures were marked with circle (Type I) and square (Type II), respectively. (b-c) The enlarged TEM images of individual Au-Ag type II hybrid nanoparticles with marked angles in either 60 ° or 120 °.

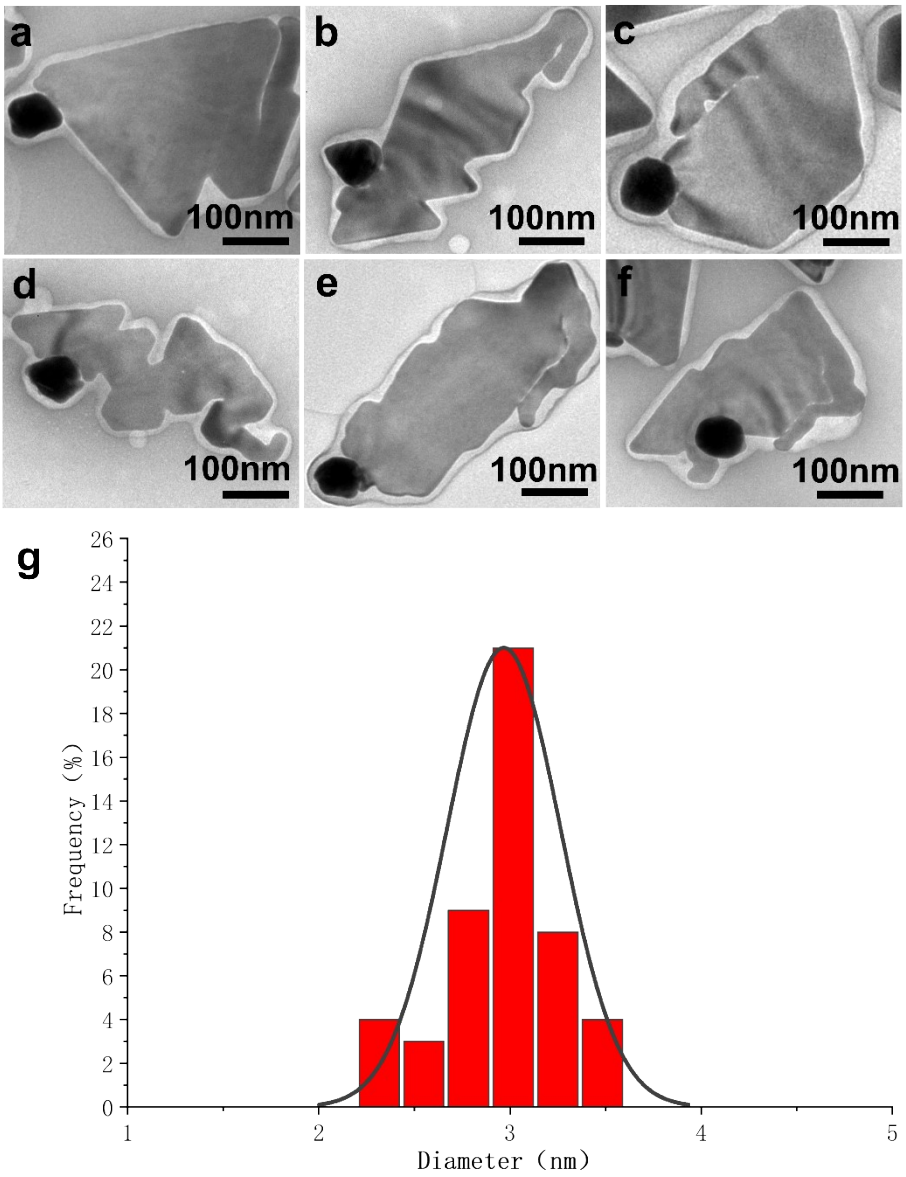

Fig. S7. (a-f) TEM image of Au-Ag plate hybrid structure and (g) gap diameter distribution.

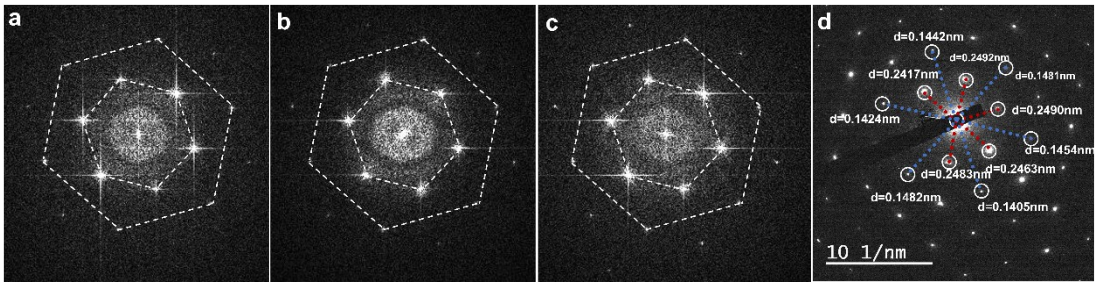

Fig. S8. (a-c) The diffraction patterns of the different area 1, 2, and 3 in Fig.3a in the maintext, in which the diffraction points were linked by dotted lines. These patterns can be completely overlapped, indicating their same lattice details. (d) The image is a measurement of the lattice spacing of selected area electron diffraction (SAED) in Fig. 3b.

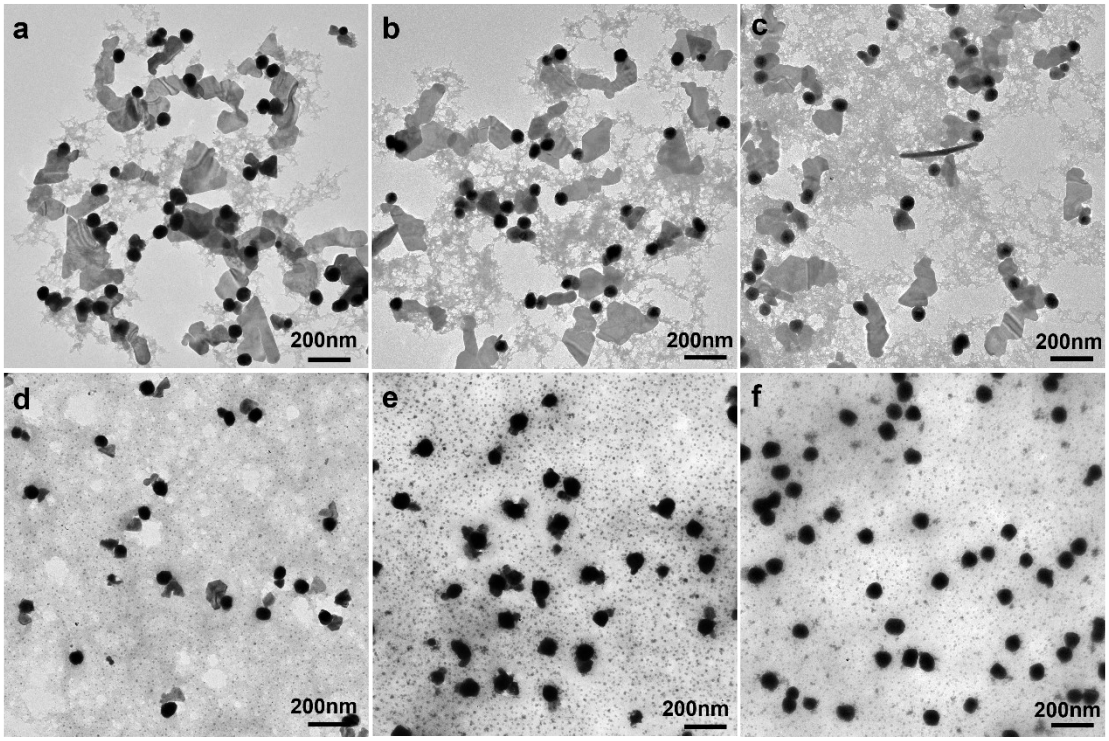

Fig. S9. The Au-Ag heterostructures synthesized under increased concentration of MBIA ligands: (a) 0.30, (b) 0.40, (c) 0.50, (d) 0.60, (e) 0.70 and (f) 0.80 mM.

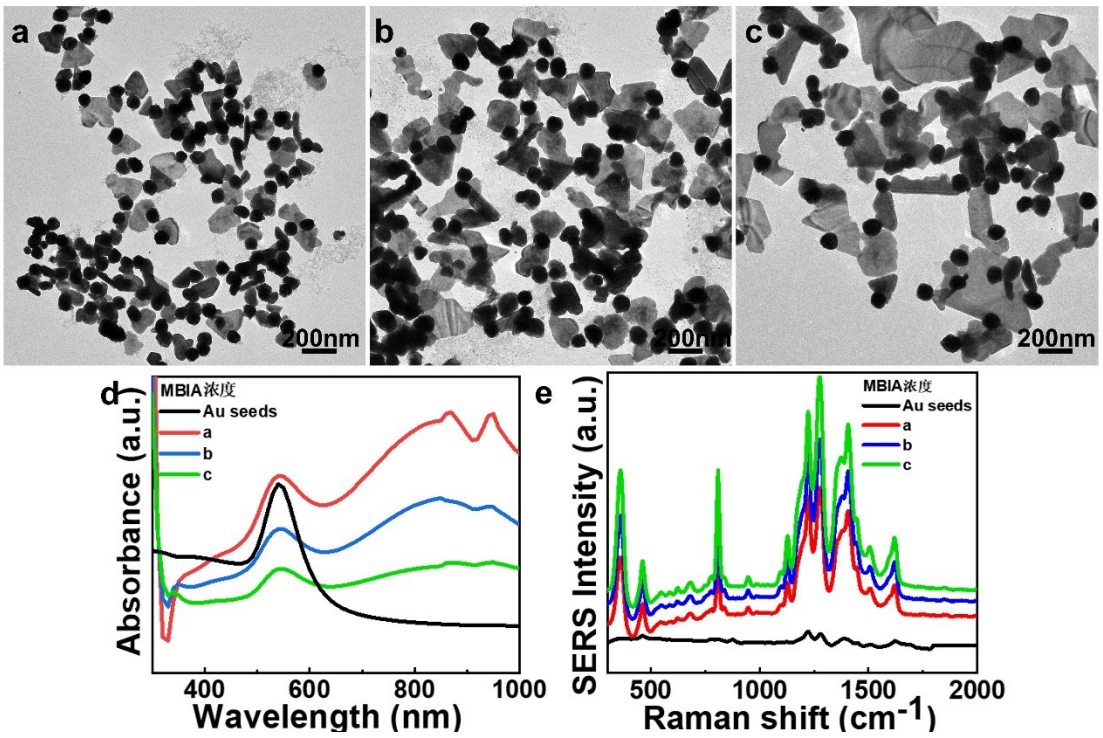

Fig. S10. (a-c) TEM images, (d) absorption spectra and (e) SERS of the Au seeds and the Au-Ag plate heterostructures synthesized by using different amounts of MBIA ligand: 0.10, 0.15 and 0.20 mM for a-c, respectively.

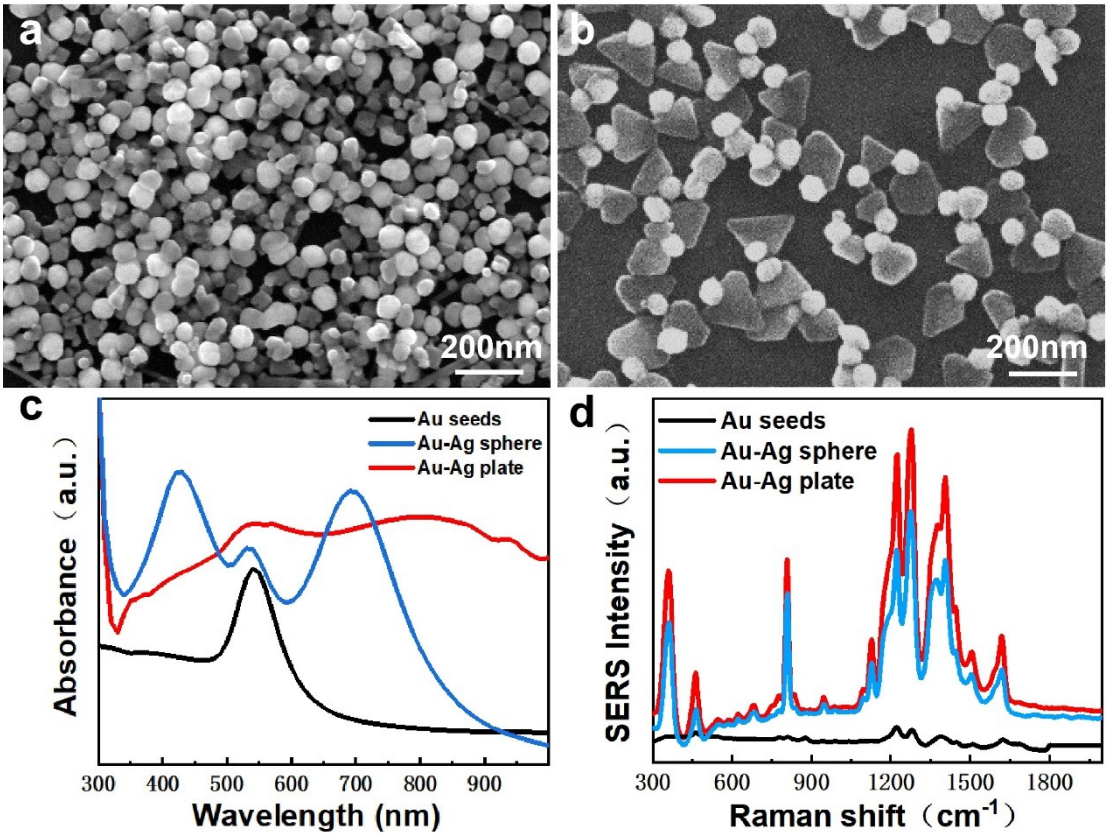

Fig. S11. SEM images of the (a) Au-Ag sphere and (b) Au-Ag triangle plate heterostructures. (c) UV-vis-NIR spectra and (d) SERS of the Au-Ag sphere and Au-Ag triangle plateheterostructures.

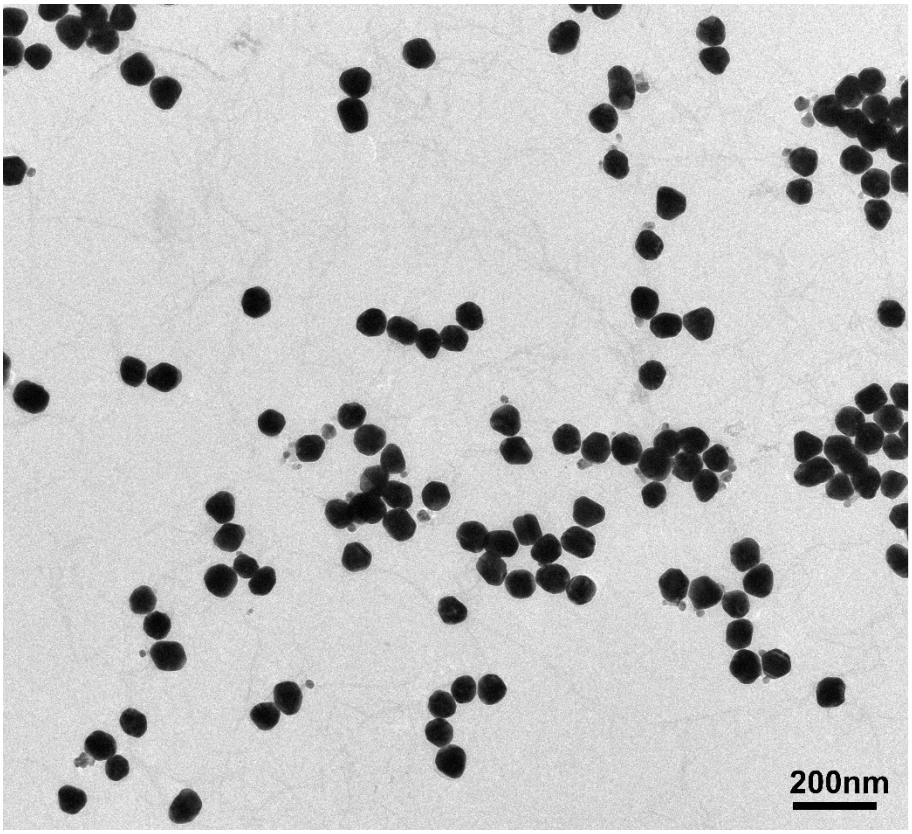

Fig. S12. TEM image of Au-Ag hybrid structure at low concentration of $AgNO_3$ and HQ (0.20 mM), used for the survey: small Ag nanoplate grown on some Au seeds about 26.53%.