Supporting Information

Copper-Templated Synthesis of Gold Microcages for Sensitive Surface-Enhanced Raman Scattering Activity

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Experimental Section

Materials and Methods

All chemicals used in our experiment were of analytical grade and used without further purification.

Synthesis of Hollow Copper microstructures. The hollow copper microstructures were synthesized by our previous report. [1] 0.012 g of 26-facet Cu_2O crystals were dispersed in 30 mL ethylene glycol (EG) in a conical flask, after the mixture was stirred for 10 min in a water bath at 60 ℃, 10 mL of NaOH aqueous solution (5 M) was added dropwise. 5 min later, 10 mL of glucose aqueous solution (1.1 M) was added into the above solution. The reaction was kept at 60 ℃ for 120 min. Afterwards, the product was cleaned with deionized water and ethanol by repeated centrifugation. Thus, the hollow copper microstructures were obtained and kept in etanol for further

application.

Characterization. The crystal phase of the as-prepared product was characterized by an X-ray diffractometer (Bruker-AXS D8 ADVANCE) using Cu-Ka radiation (λ= 1.54 Å) in the range (20–80°). X-ray photoelectron spectroscopy (XPS) measurements were performed on a Kratos Axis Ultra DLD spectrometer using an Al mono Ka X-ray source. The morphology of the samples was investigated by field-emission scanning electron microscopy (FESEM) using JEOL (JSM-7000F). The transmission electron microscopy (TEM) and high resolution transmission electron microscopy (HRTEM) analysis were performed on a JEOL JEM-2100 TEM operating at an accelerating voltage of 200 kV. The ultraviolet-visible (UV-Vis) absorption spectra were measured by a UV/vis/NIR spectrophotometer (Hitachi U-4100).

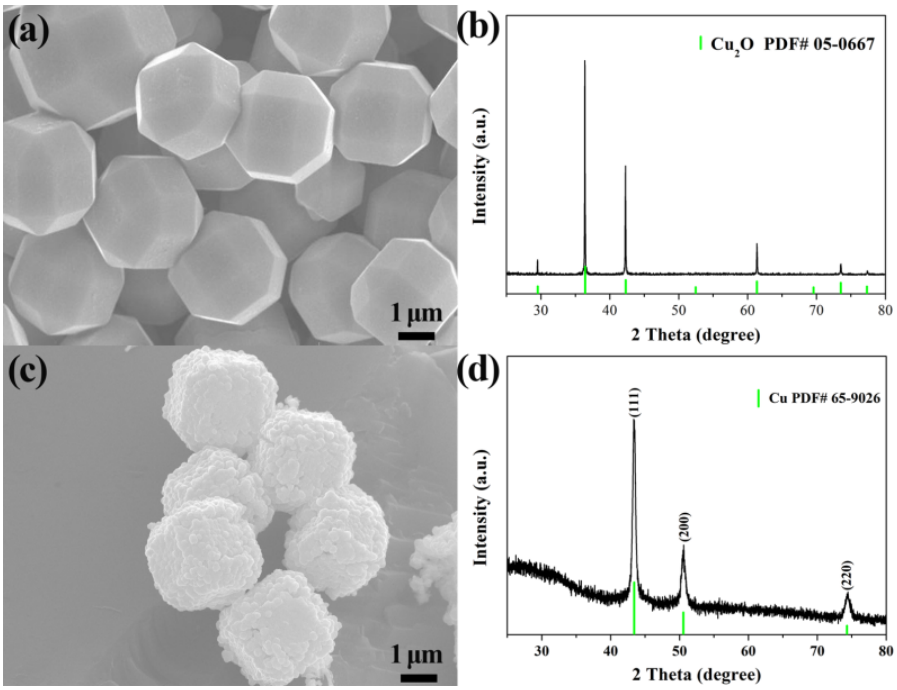

Fig. S1 The XRD patterns and FESEM pictures of (a) (b) Cu_2O crystals and (c) (d) hollow Cu templates.

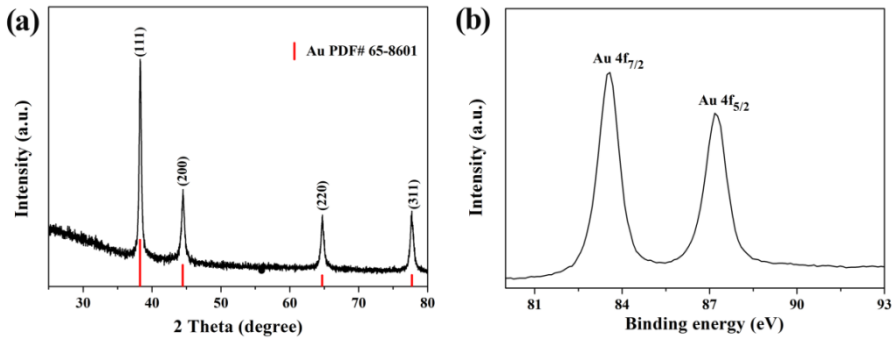

Fig. S2 (a) XRD pattern, (b) Au 4f XPS spectrum of the as-prepared Au microcages.

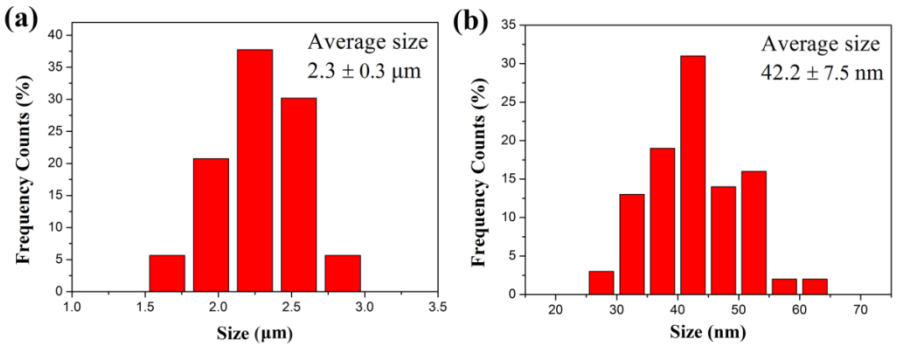

Fig. S3 The size distribution of Au microcages (a) and nanoparticles (b)

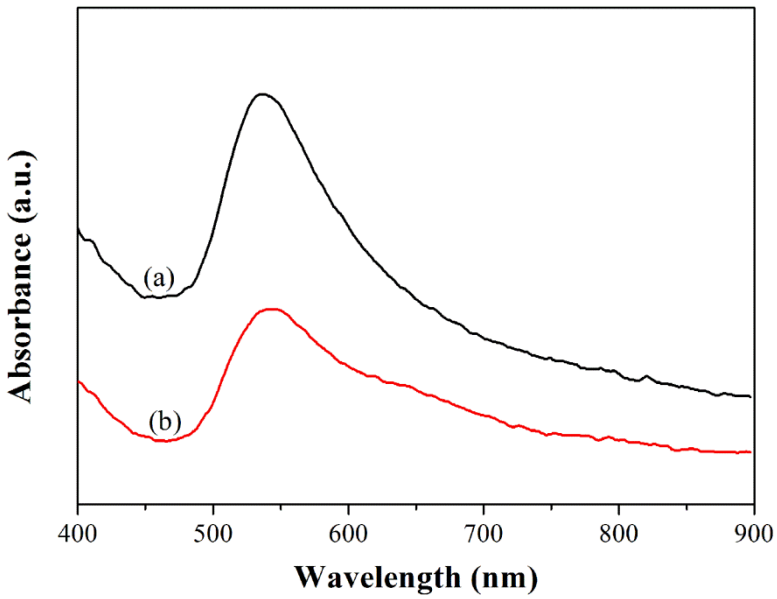

Fig. S4 Uv-vis spectra of (a) Au microcages and (b) Au microcages after addition of 4-MBA.

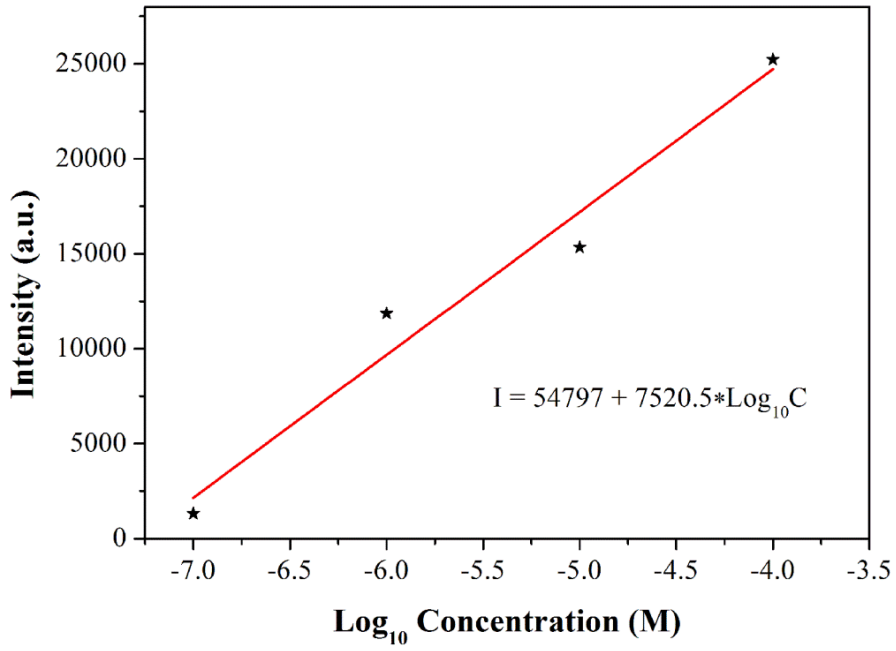

Fig. S5 the linear relationship between the intensities at 1589 cm^{-1} and the logarithmic concentration of 4-MBA.

1 C. C. Kong, S. D. Sun, X. Z. Zhang, X. P. Song and Z. M. Yang, *CrystEngComm*, 2013, **15,** 6136-6139.