

Supporting Information

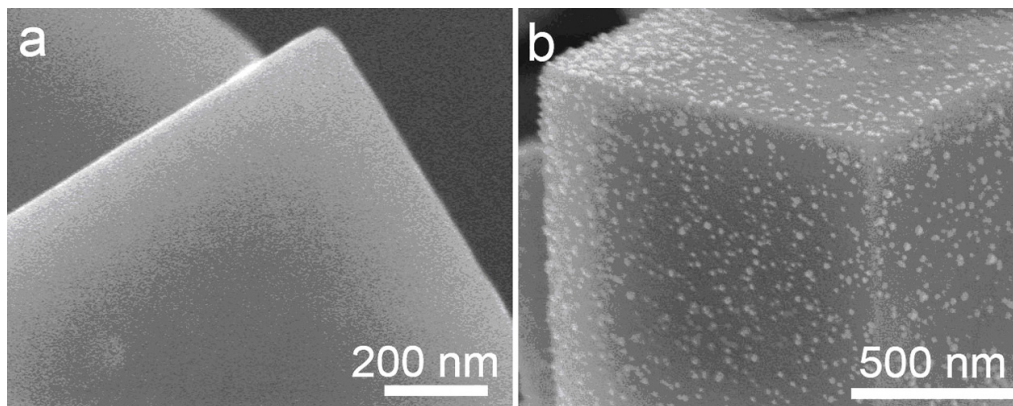


Figure S1 SEM images of Cu₂O template precursors before (a) and after (b) reaction with HAuCl₄ for 10min.

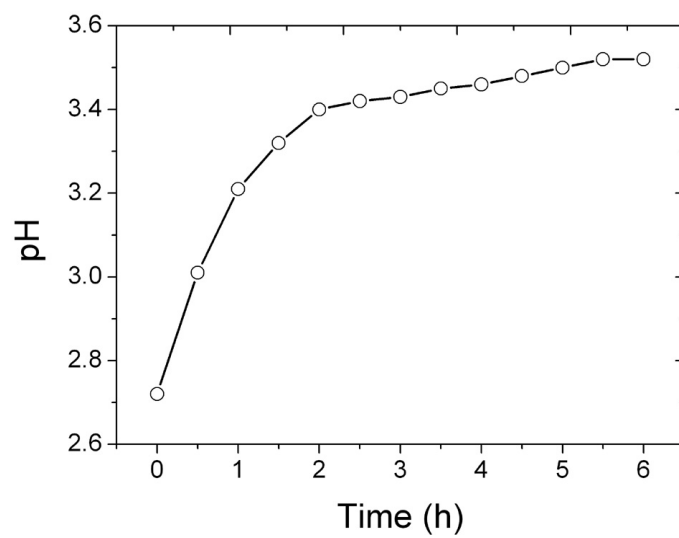


Figure S2 Curve of pH value change with reaction time during the transformation process of Cu_2O sacrificial templates to gold nanoshells.

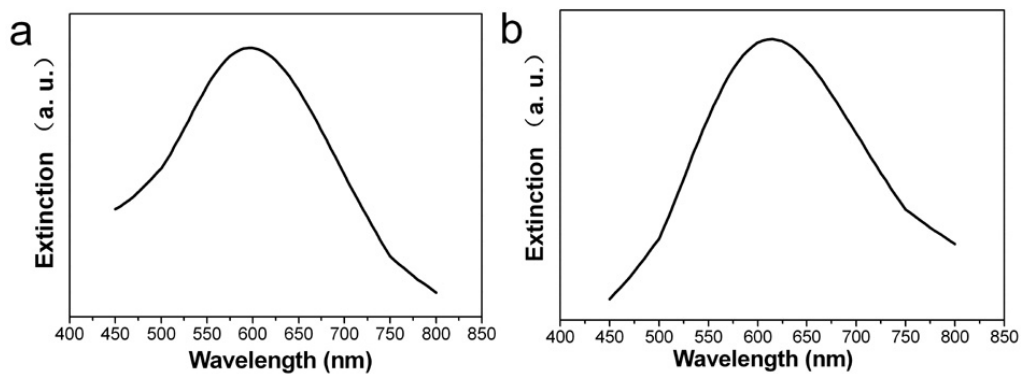


Figure S3 UV-vis extinction spectra of (a) the mixture of supernatant solution which was separated from reaction of Cu_2O with HAuCl_4 for 6h and ammonia solution (b) the as prepared $[\text{Cu}(\text{NH}_3)_4]\text{SO}_4$ solution .

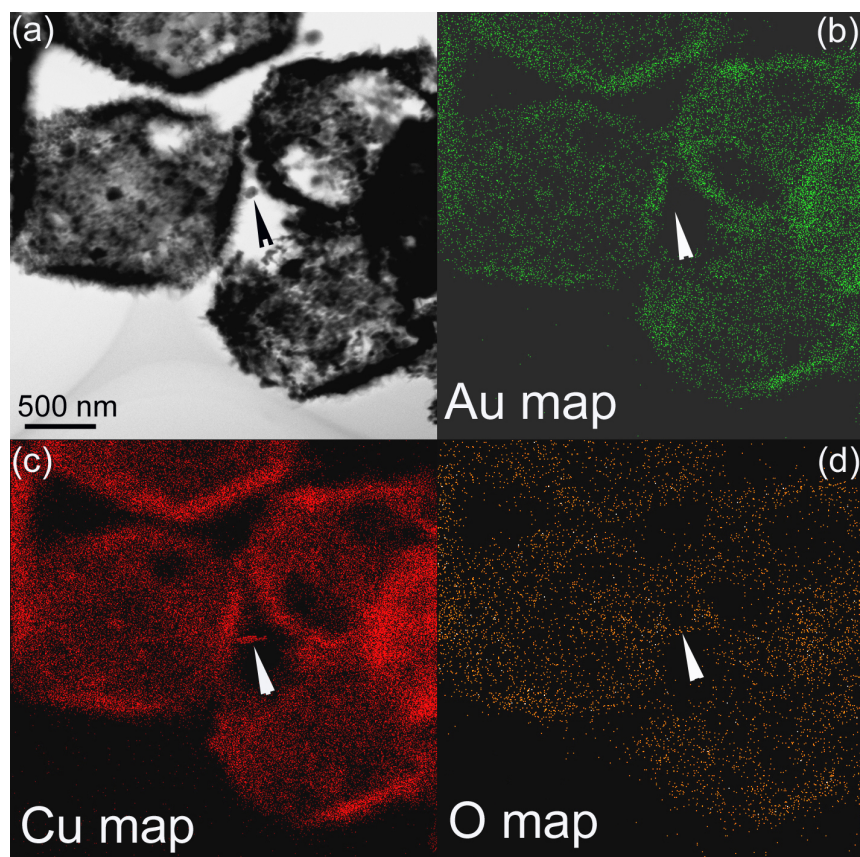


Figure S4 Morphology and composition of several cubic cages. (a) Low magnification TEM image showing several cubic cages. (b) Au, (c) Cu, and (d) O maps from the cages as shown in (a).

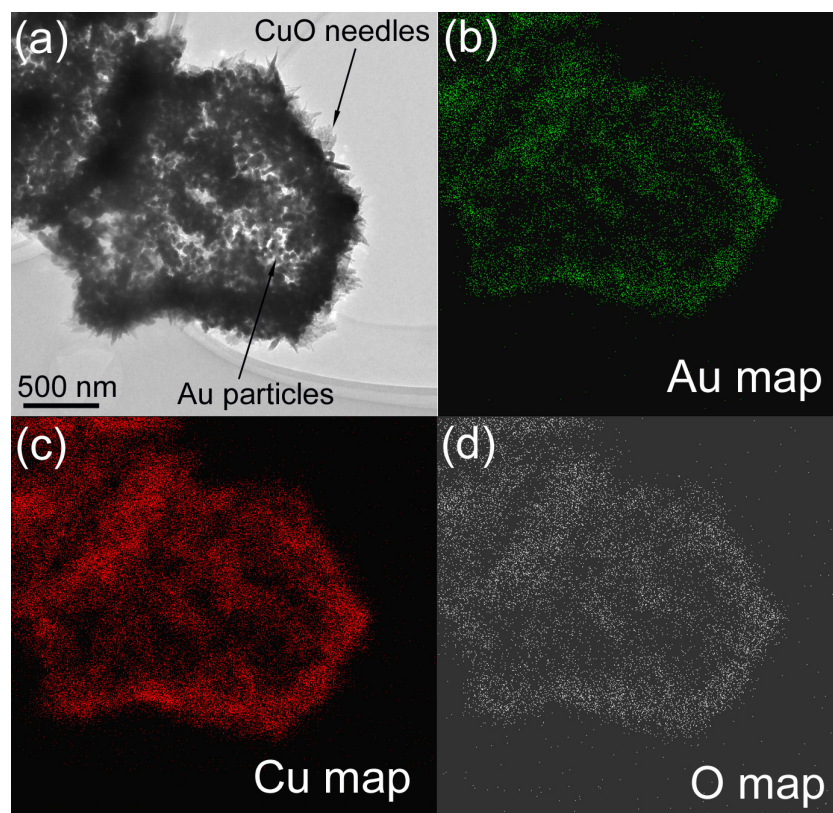


Figure S5 Morphology and composition of an individual cubic cage. (a) Low magnification TEM image showing the cubic cage. (b) Au, (c) Cu, and (d) O maps from the cage as shown in (a), showing that CuO heterogeneously nucleated on Au nanograins.

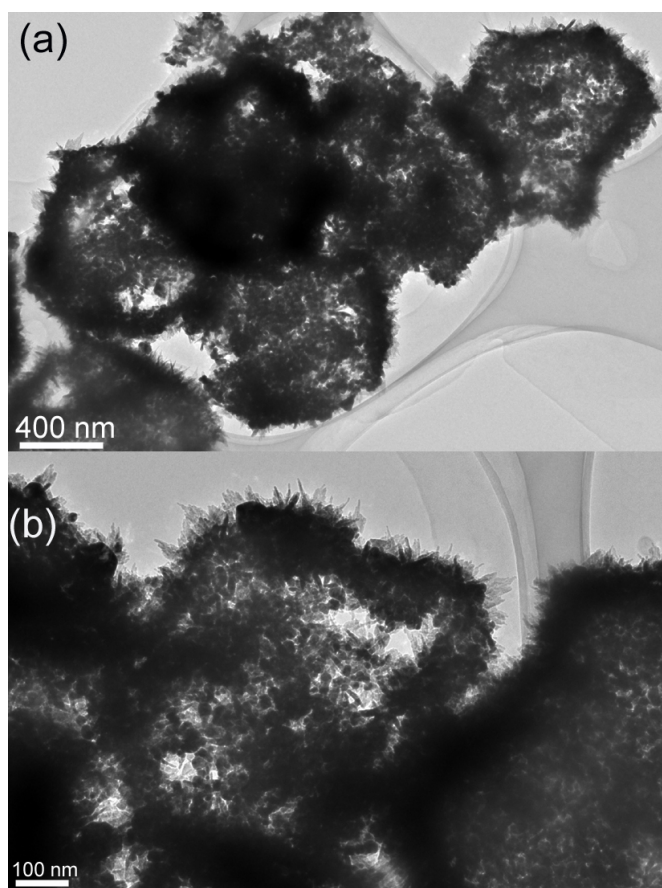


Figure S6 (a) Low-magnification and (b) middle- magnification TEM images showing that the CuO needles intergrowth with Au particles.