Supporting Information

Light-Assisted Schottky Barrier Enhancement for Selective Detection of L-Cysteine using Ni/Cu_2O/Ag nanocubes

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1. Synthesis of Cu_2O/Ag nanocube composites

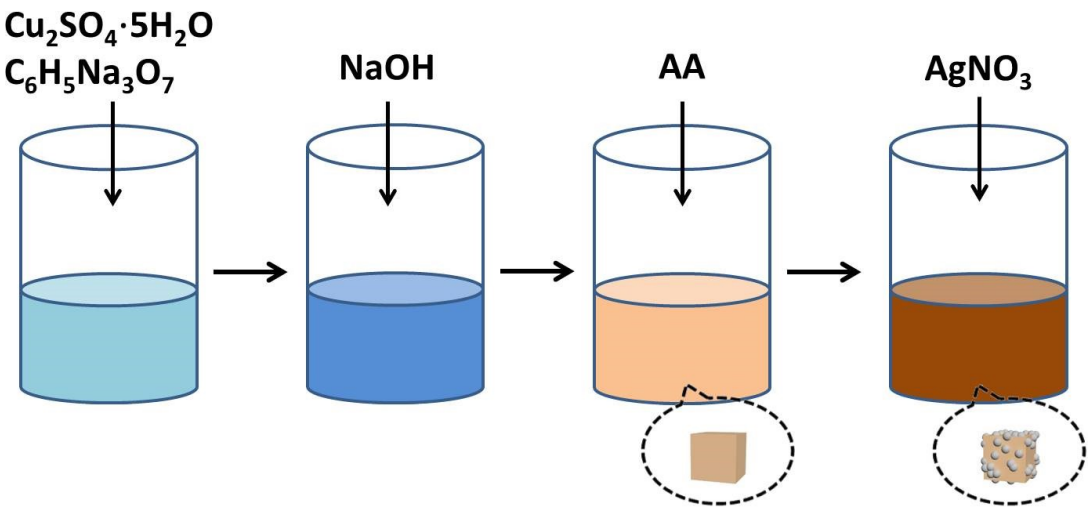

Figure S1 Synthesis of Cu_2O/Ag nanocube composites

2. EDS and XRD

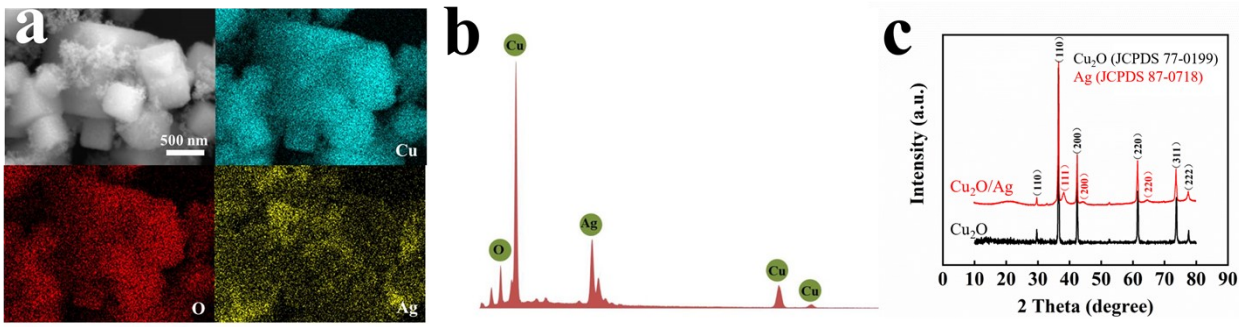

Figure S2 (a) Element mapping images and (b) SEM-EDS spectrum of the Cu_2O/Ag nanocube composite (c) XRD spectra of Cu_2O/Ag and Cu_2O nanocube.

3. XPS spectra of Cu_2O/Ag nanocubes

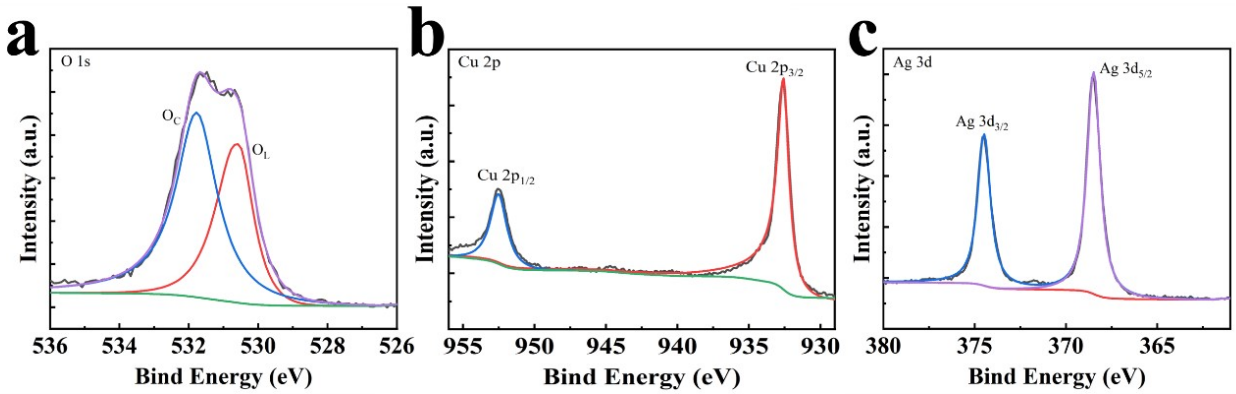

Figure S3 High-resolution XPS spectra of O 1s (a), Cu 2p (b) and Ag 3d (c) of Cu_2O/Ag nanocubes.

4. Cyclic voltammetry (CV) of Ni/Cu_2O/Ag electrode in potassium ferrocyanide

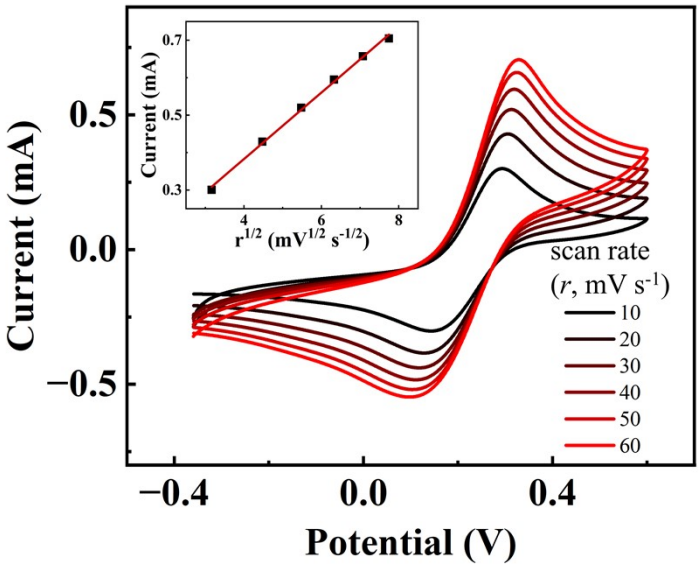

Figure S4 CV curves of Ni/Cu_2O/Ag electrode in 0.1 M KCl and 5.0 mM potassium ferrocyanide solution at different scan rates (10, 20, 30, 40, 50 and 60 mV/s). Inset is the plot of anodic peak current versus the square root of scan rate ($r^{1/2}$).

5. Electrochemical impedance spectra (EIS) of Ni/Cu_2O and $Ni/Cu_2O/Ag$ electrodes

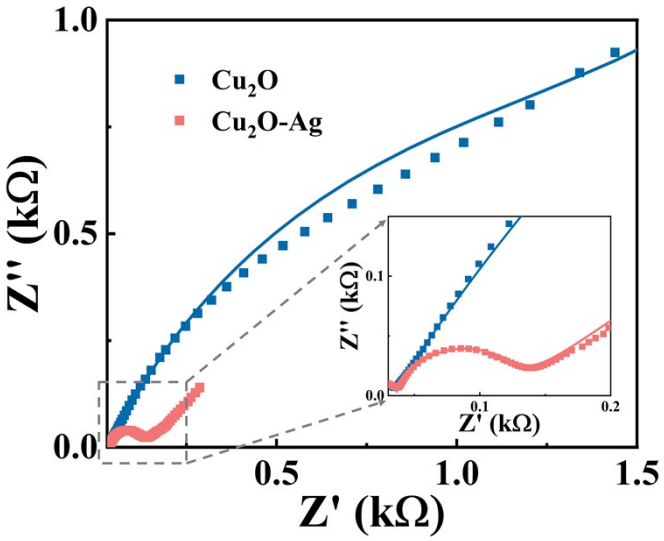

Figure S5 Electrochemical impedance spectra (EIS) of Ni/Cu_2O and $Ni/Cu_2O/Ag$ electrodes in 0.1 M KCl and 5.0 mM potassium ferrocyanide solution. Frequency: 10^{-1}-10^5 Hz.

6. DPV response of Ni/Cu_2O/Ag electrode to L-Cys at pH 5.05

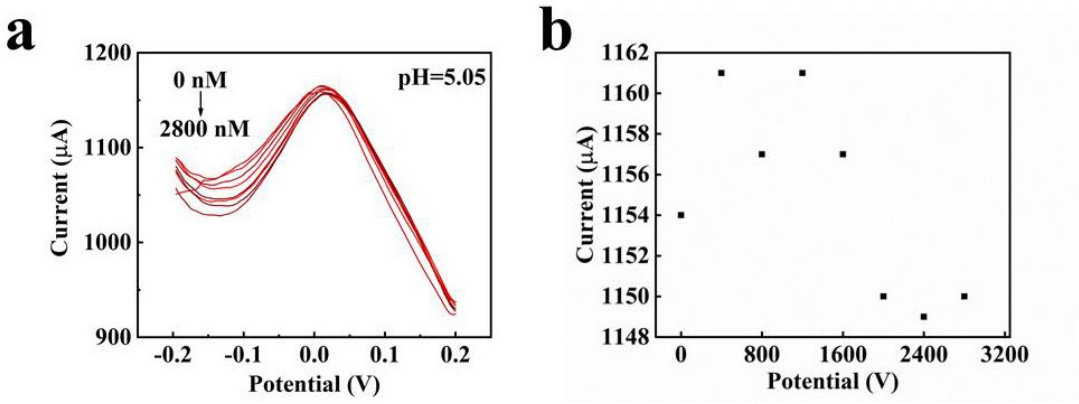

Figure S6 (a) DPV curves of the Ni/Cu_2O/Ag electrode to different concentrations of L-Cys in PBS at pH = 5.05; (b) The corresponding linear calibration of peak current versus L-Cys concentrations.

7. DPV response of Ni/Cu_2O or Ni/Ag to L-Cys at pH 3.0 or 7.0

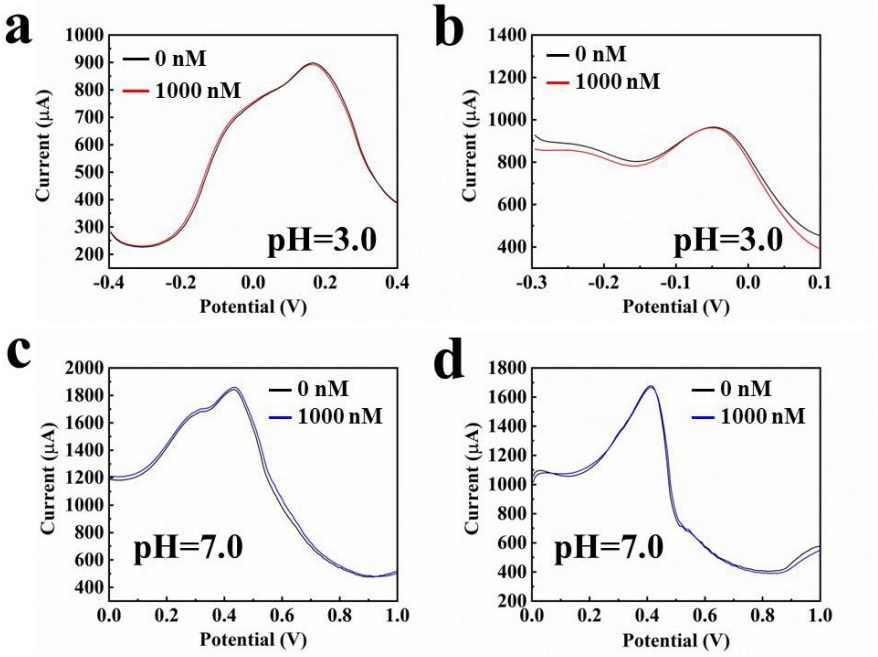

Figure S7 DPV current response of Ni/Cu_2O electrode, added 1 μA L-Cys to 0.1 nM PBS solution at (a) pH=3.0 and (b) pH=7.0; Ni/Ag electrode, added 1 μA L-Cys DPV current response to 0.1 nM PBS solution at (c) pH=3.0 and (d) pH=7.0.