Supplementary information

Unconventional Synthesis of Cu-Au Dendritic Nanowires with Enhanced Electrochemical Activity

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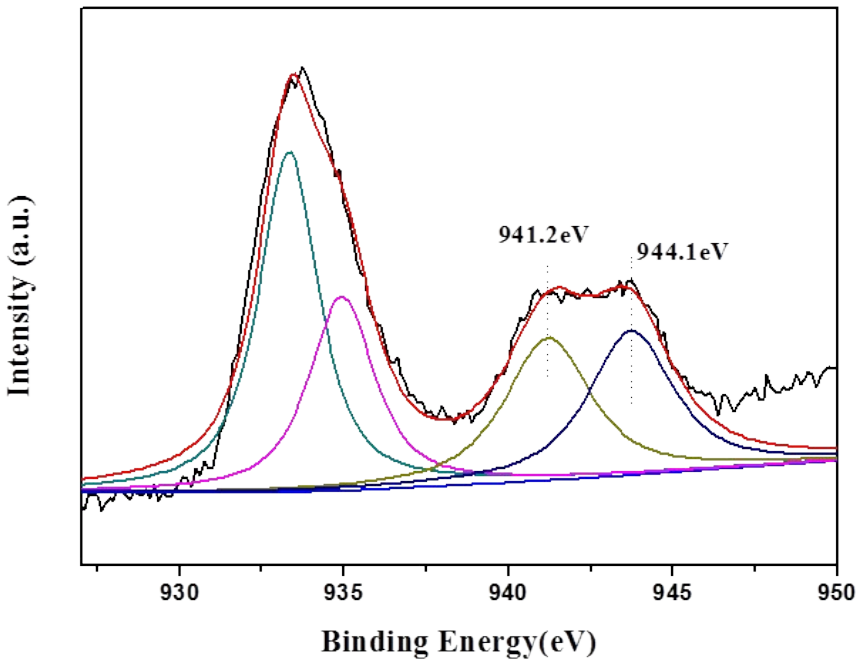
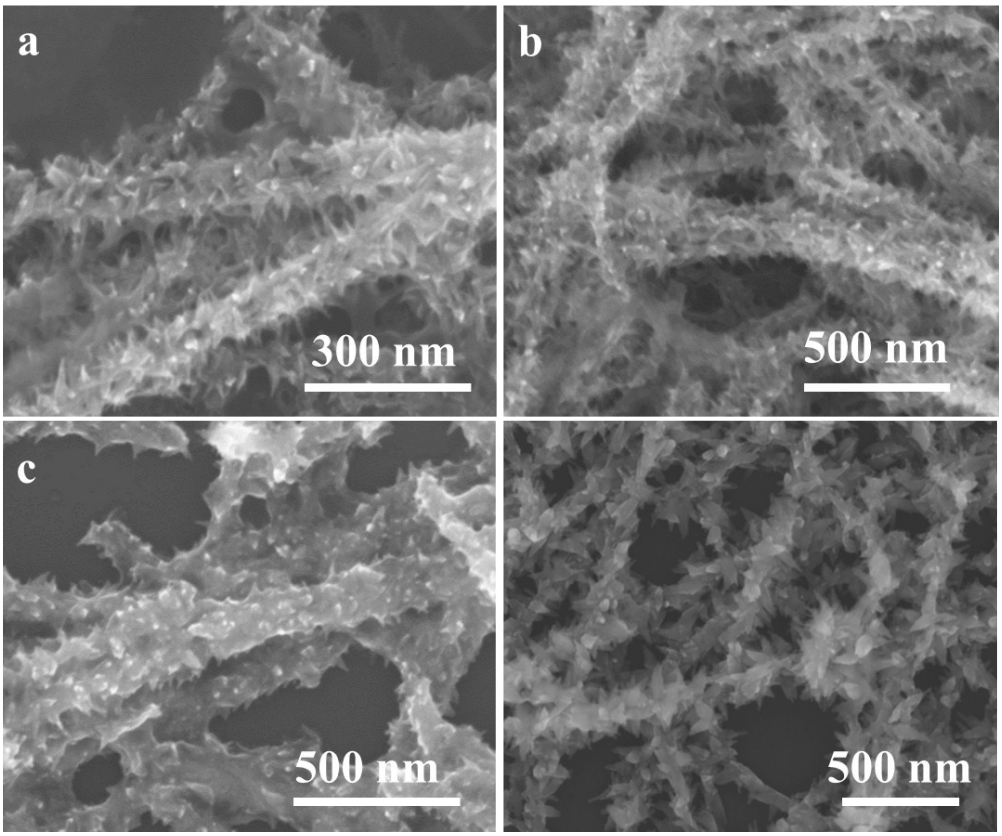
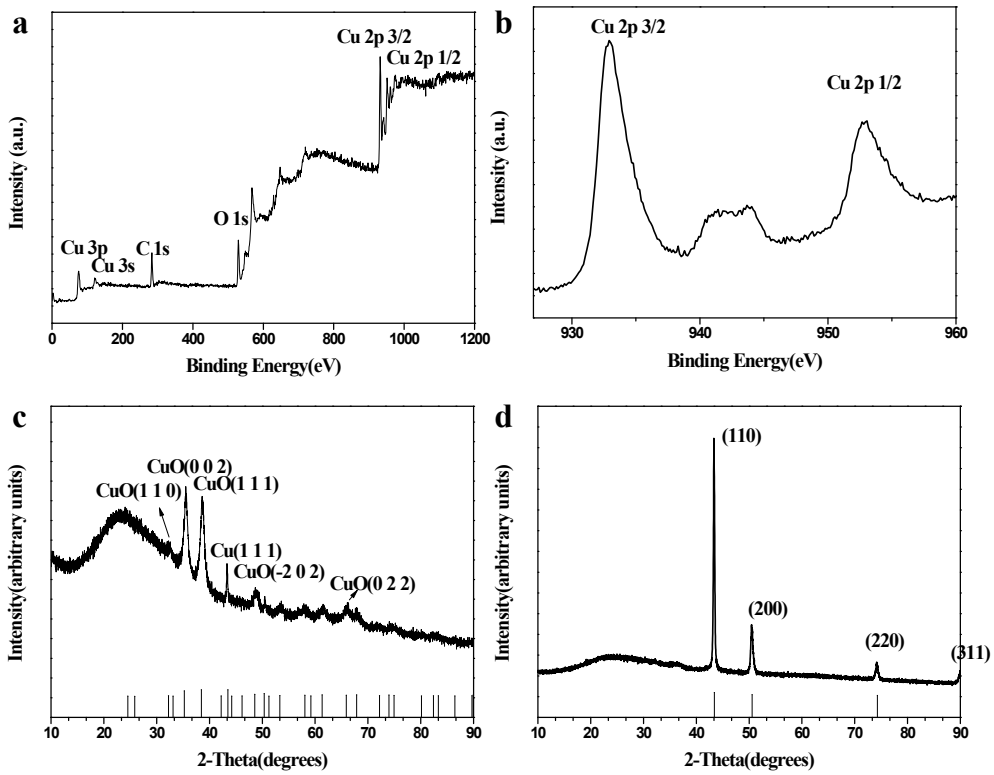


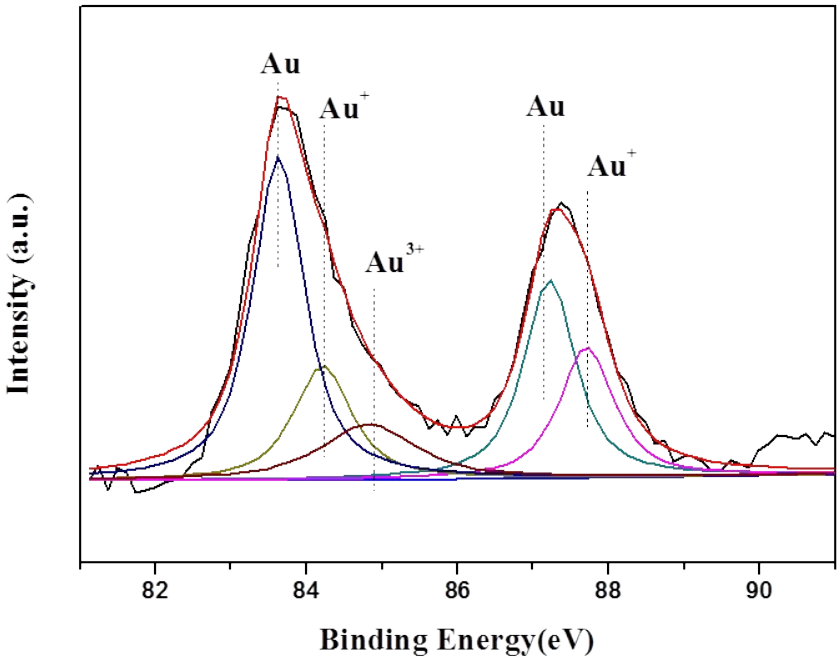
Supplementary Figure S1 | Cu 2p XPS spectra of Cu-Au dendritic NWs, confirming the valence state of Cu.



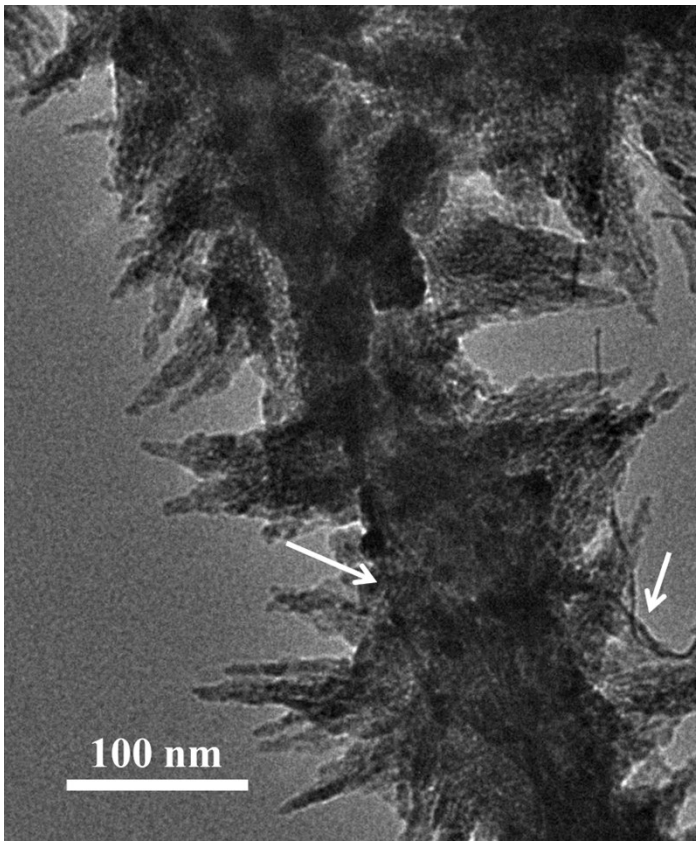
Supplementary Figure S2｜SEM images of as-synthesized Cu-Au dendritic NWs with different surfactants. Anionic surfactant (a) sodium dodecyl sulfate (SDS), polymer surfactant (b) polyacrylic acid, (c) polyvinylpyrrolidone (PVP) and neutral surfactant (d) TritonX-100.



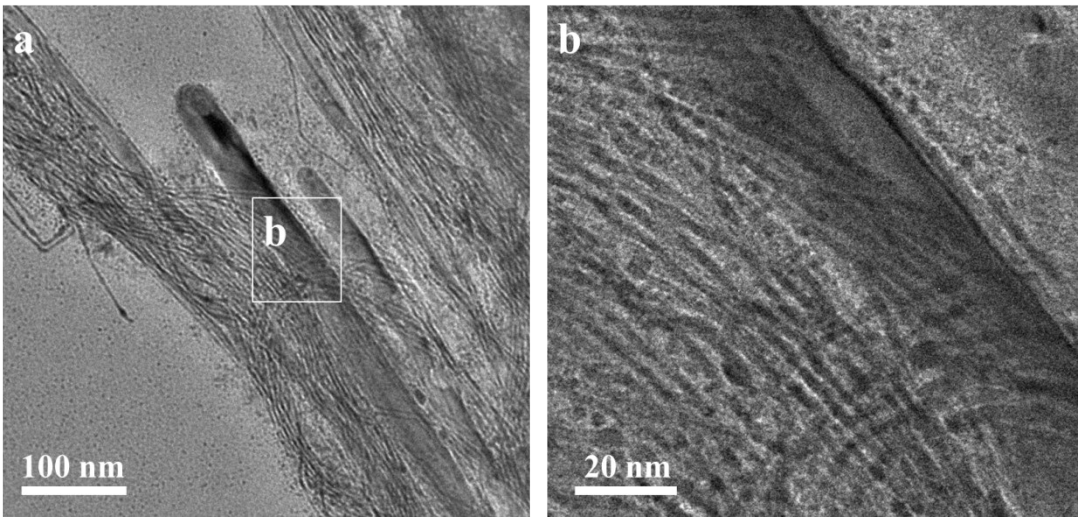
Supplementary Figure S3｜X-ray photoelectron spectra (XPS) and X-Ray Diffraction (XRD) patterns of Cu dendritic nanostructure. (a, b) XPS and (c) XRD pattern of the as-synthesized Cu dendritic nanostructure. (d) XRD pattern of the Cu NWs.



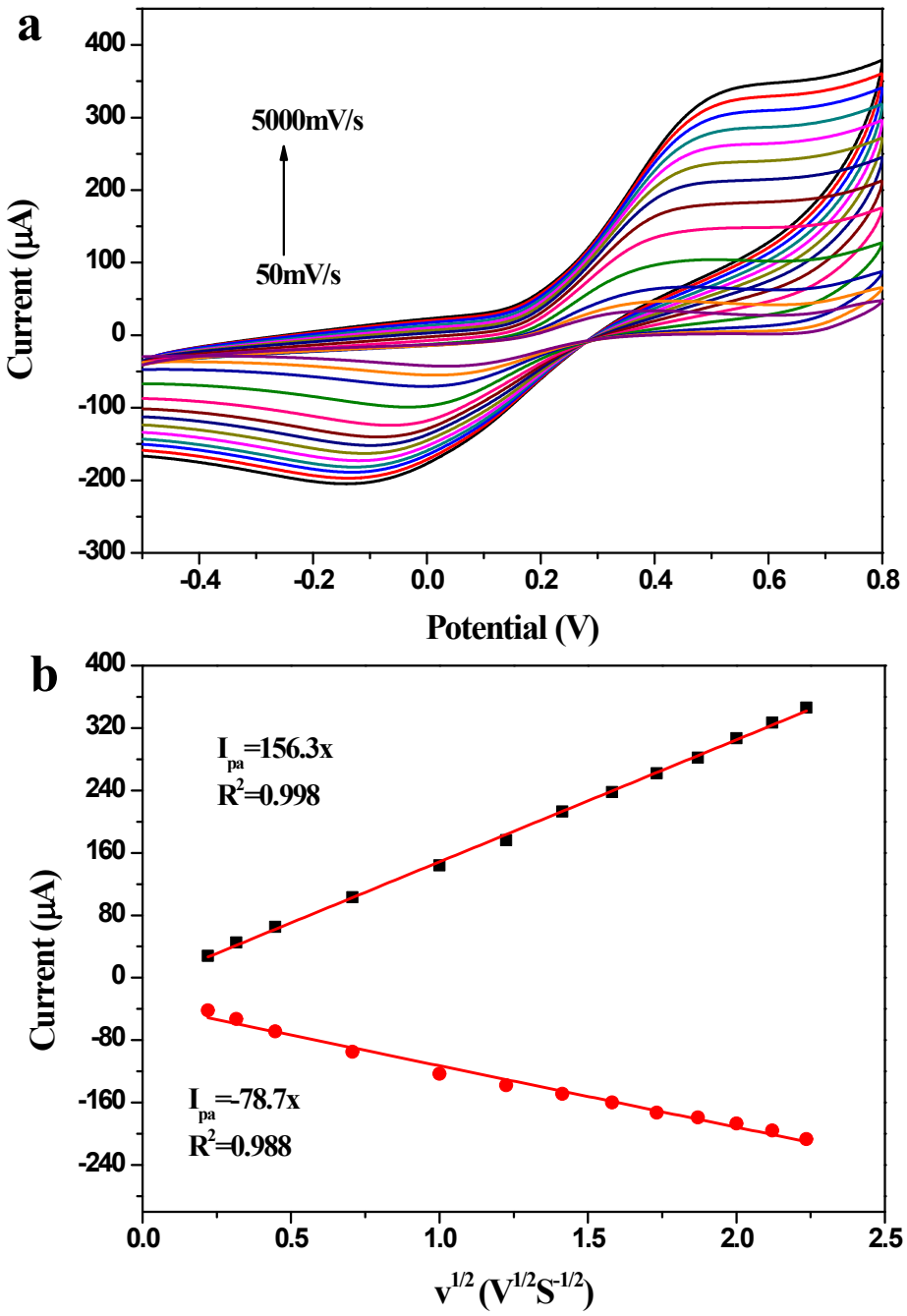
Supplementary Figure S4 | Confirmthe valence state of Au.Au 4f XPS spectra of Au NWs.



Supplementary Figure S5 | TEM image of the as-synthesized Cu-Au dendritic NWs. The arrows indicate broken Au NW bundles.



Supplementary Figure S6｜TEM images of the product after placing Cu NWs and Au NWs with surfactant for 2h at room temperature. (a). (b) High magnification TEM image of highlighted areas in (a).



Supplementary Figure S7 | Caculation of sensitivity of glucose detection with Cu-Au dendritic NWs modified electrode. (a)Cyclic voltamagrams (CVs) of Cu-Au dendritic structure in 5mM $K_3Fe(CN)_6$ with different scan rates from 0.05V~5V s^{-1} .(b) Plots of anodic and cathodic peak currents vs.square root of scan rate.

CVs in 5mM $K_3Fe(CN)_6$ were used to estimate electrochemically active surface area (ESA).

$i_p/A=(2.69x10^5)\cdot n^{3/2}\cdot D_0^{1/2}\cdot C_0\cdot v^{1/2}$（1）

where i_p，n，D_0, C_0, v are oxidation or reduction peak current, electron transfer number, diffusion coefficient($0.76x10^{-5}cm^2s^{-1}$), initial concentration of $K_3Fe(CN)_6$ ($5x10^{-6}$mol cm^{-3}),and scan rate, respectively. A is ESA, calculated to be $0.032cm^2$.

Slope of the curve from Fig.5d of the main article divided by ESA gives the electrode calculated sensitivity of 32.18 $\mu AmM^{-1}cm^{-2}$.