

Supporting Information For

Preparation of Au nanoparticles *via* anodic stripping of underpotential deposition-Cu in bulk electrodeposition-Au for high-performance electrochemical sensing of bisphenol A

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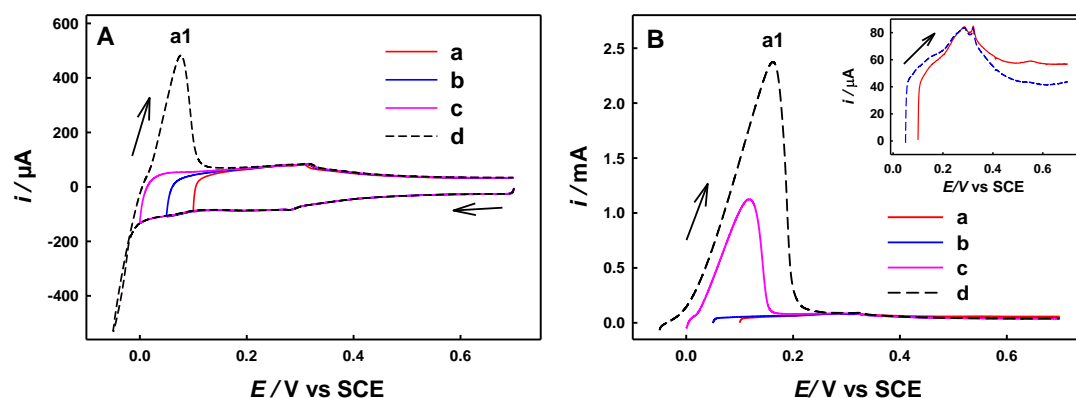


Figure S1. (A) CV curves with different negative potential limits (a: 0.1 V, b: 0.05 V, c: 0 V and d: -0.05 V) and (B) LSASV curves on Au electrode after 20 s preconcentration at 0.1 V (a), 0.05 V (b), 0 V (c) and -0.05 V (d). Inset: magnification of LSASV curves a and b for the graph B. Solution: 10 mM CuSO₄ + 0.2 M aqueous HClO₄. Scan rate: 50 mV s⁻¹. The arrow indicates the direction of the scanning here.

The CV experiments show that the oxidation peak of Cu(0) to Cu²⁺ (P_{a1}) appears for a negative potential limit at -0.05 V (d). However, at negative potential limit of 0.1 V (a), 0.05 V (b) and 0 V (c), the oxidation peak of Cu(0) to Cu²⁺ (P_{a1}) disappears. The LSASV curves after preconcentration for 30 s show that peaks P_{a1} appear when the preconcentration potential is at -0.05 V (d) and 0 V (c), but peak P_{a1} disappear after preconcentration at 0.05 V (b) and 0.1 V (a). The small oxidation peaks indicate the anodic stripping of UPD-Cu in the inset. The oxidation peak of Cu(0) to Cu²⁺ (P_{a1}) disappears by CV but appears by LSASV at negative potential limit of 0 V here, which could be due to a short time for BD of Cu by CV. In general, both CV and LSASV experiments indicate that here only UPD of Cu but no BD of Cu occur at 0.05 V and 0.1 V. In order to completely avoid the simultaneous BD of Cu on Au, a deposition potential of 0.1 V was selected here for preparation of Au_{Cu-UPD}/MWCNTs/GCE. In addition, the anodic stripping of UPD-Cu can completely finished at 0.6 V as shown in the inset of graph B.

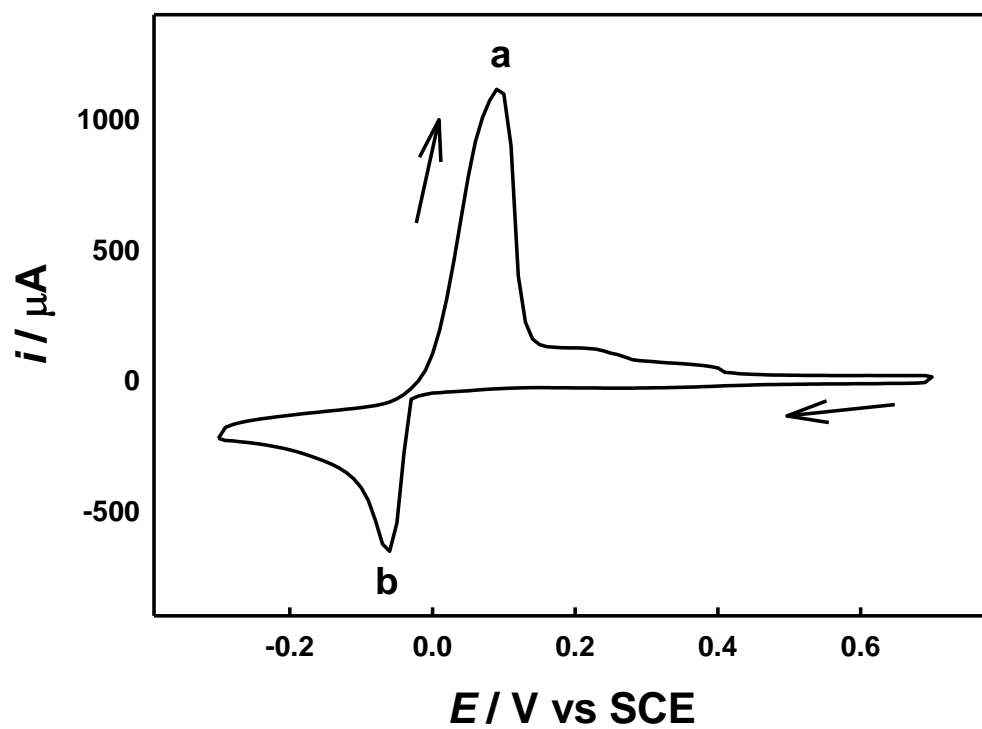


Figure S2. CV curves on the $\text{Au}_{\text{Con}}/\text{MWCNTs}/\text{GCE}$ in 0.2 M aqueous HClO_4 containing 10 mM CuSO_4 . Scan rate: 50 mV s^{-1}

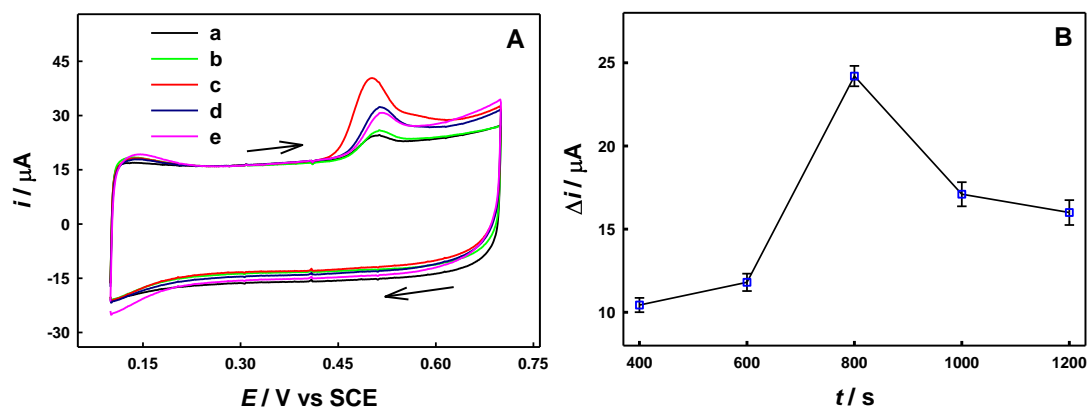


Figure S3. CV curves of the $\text{Au}_{\text{Cu-UPD}}/\text{MWCNTs}/\text{GCEs}$ prepared by varying Cu-underpotential/Au-bulk coelectrodeposition time in 0.1 M PBS (pH 7.5) containing 10 μM BPA (A), and relationship between the oxidation peak current of BPA and coelectrodeposition time. Scan rate: 50 mV s^{-1} .

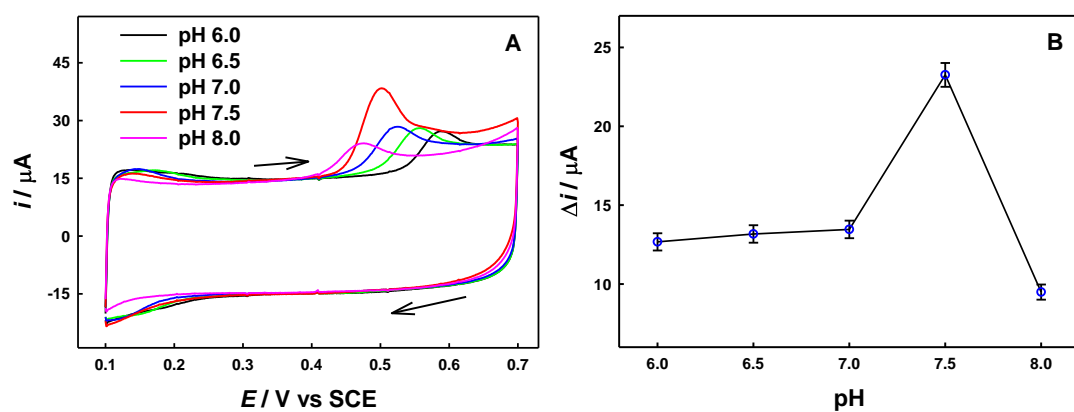


Figure S4. CV curves of the Au_{Cu}-UPD/MWCNTs/GCEs in 0.1 M PBS with different pH values

(6.0, 6.5, 7.0, 7.5 and 8.0) containing 10 μM BPA (A), and a plots of peak current against pH

(B). Scan rate: 50 mV s⁻¹.

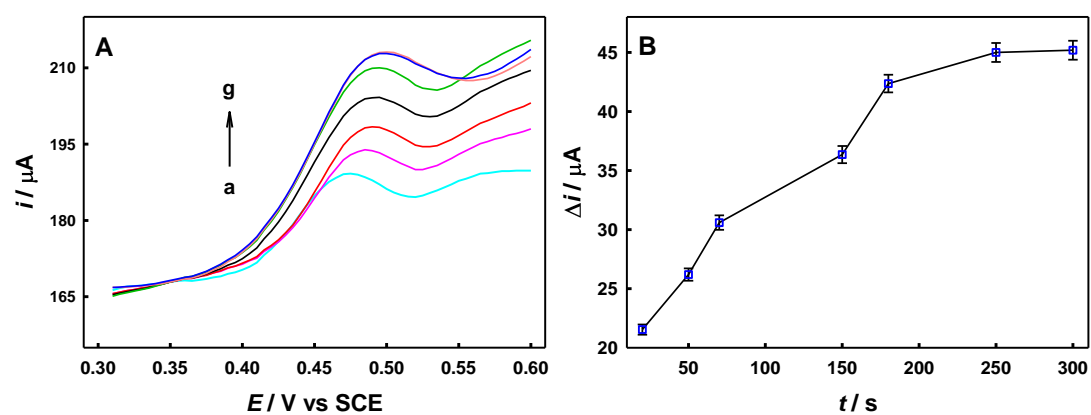


Figure S5. DPV curves of the Au_{Cu}-UPD/MWCNTs/GCE in 0.1 M PBS (pH 7.5) containing 10 μ M BPA at different preconcentration time (A) and a plots of peak current of the corresponding DPV curves against different preconcentration times (B). Preconcentration potential: 0.3 V.

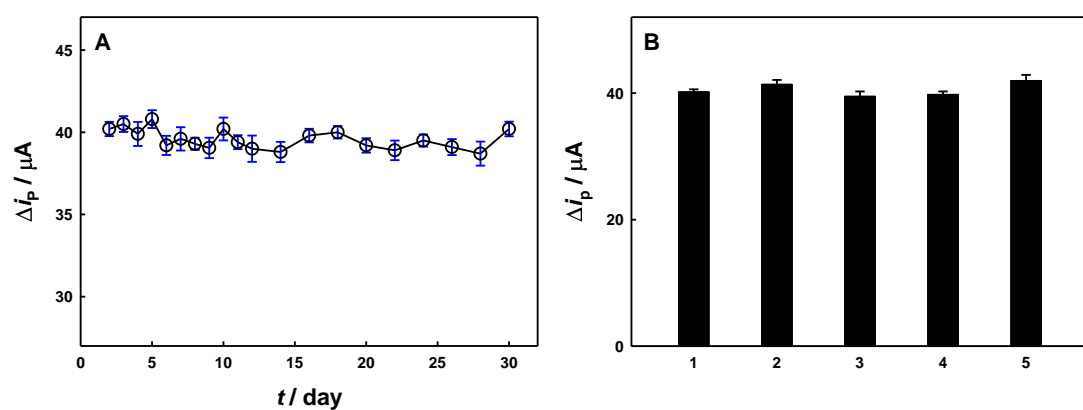


Figure S6. Stability of Au_{Cu}-UPD/MWCNTs/GCE with repeated detection of BPA for 30 days

(A). Reproducibility on five Au_{Cu}-UPD/MWCNTs/GCE (No.1-5) with detection of BPA (B). All data were obtained from every DPV response in 0.1 M PBS (pH 7.5) containing 5 μM BPA and average values calculated from three determinations. 300 s preconcentration and at preconcentration potential of 0.3 V.