biosensors

MDPI

Supplementary Material

Electrodeposited rGO/AuNP/MnO_2 Nanocomposite-modified Screen-Printed Carbon Electrode for Sensitive Electrochemical Sensing of Arsenic(III) in Water

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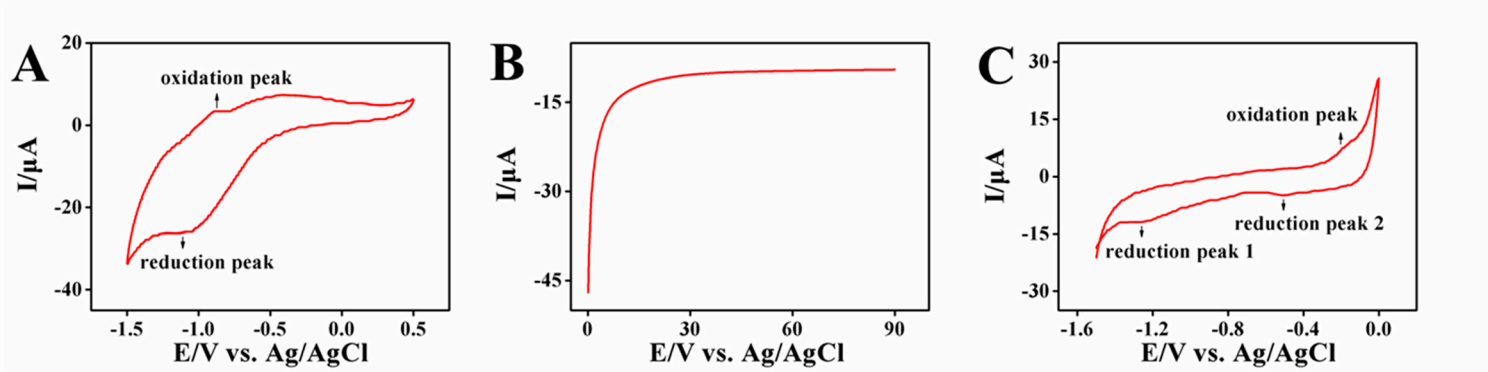

Figure S1. Cyclic voltammograms for (A) synthesis of rGO/SPCE in 1.0 mg mL^{-1} graphene oxide dispersion (0.1 mol L^{-1} pH 9.0 CBS). Segments: 8. Scan rate: 50 mV/s; (B) synthesis of rGO/AuNPs/SPCE via constant potential deposition in 1.0 mmol L^{-1} $HAuCl_4$ (0.2 mol L^{-1} Na_2SO_4). Deposition potential: −0.2 V. Deposition time: 90 s; (C) synthesis of rGO/AuNPs/MnO_2/SPCE in 0.05 mol L^{-1} $C_4H_6MnO_4 \bullet 4H_2O$ (0.1 mol L^{-1} Na_2SO_4). Segments: 2. Scan rate: 50 mV/s.

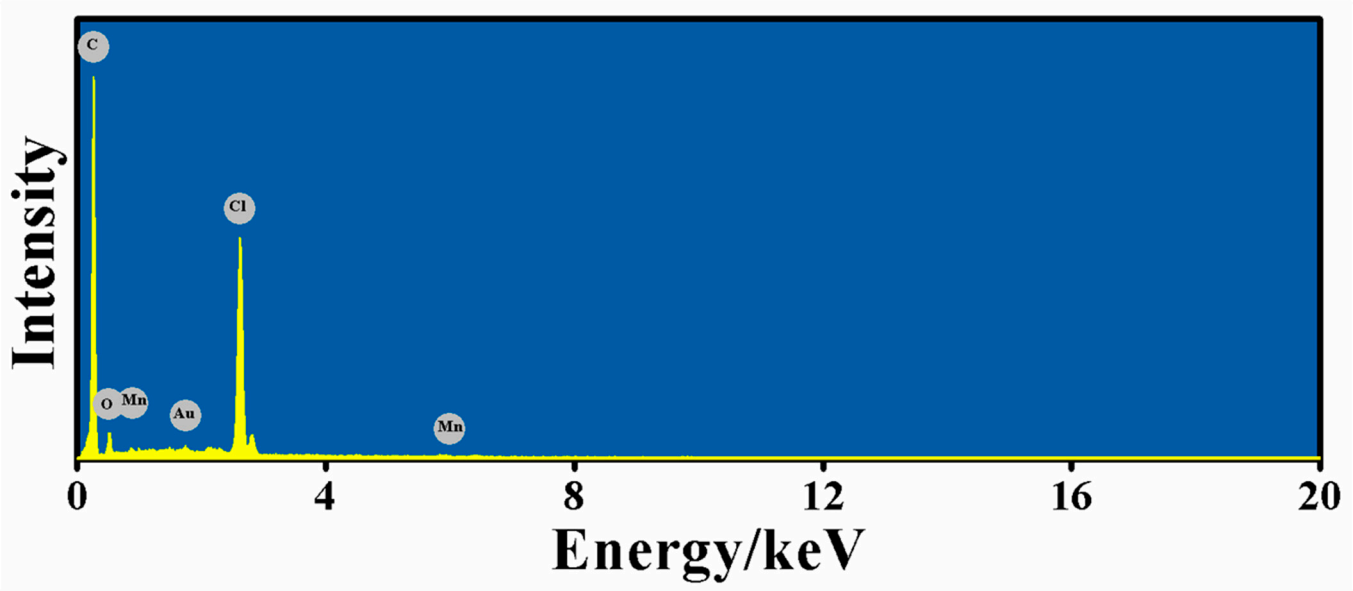

Figure S2. EDS images of rGO/AuNPs/MnO_2/SPCE.

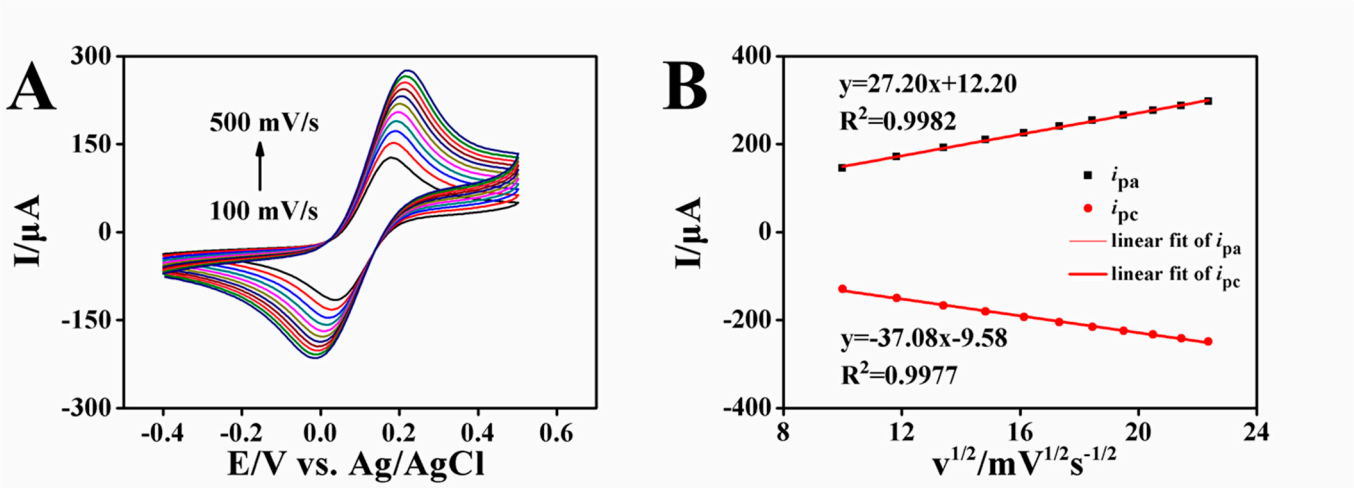

Figure S3. Cyclic voltammograms of 5 mmol/L $Fe(CN)_6^{3-/4-}$ in a 0.1 mol/L KCl solution recorded on rGO/AuNPs/MnO_2/SPCE at different scan rates (A); Corresponding linear relationship between the redox peak currents and the scan rate (B).

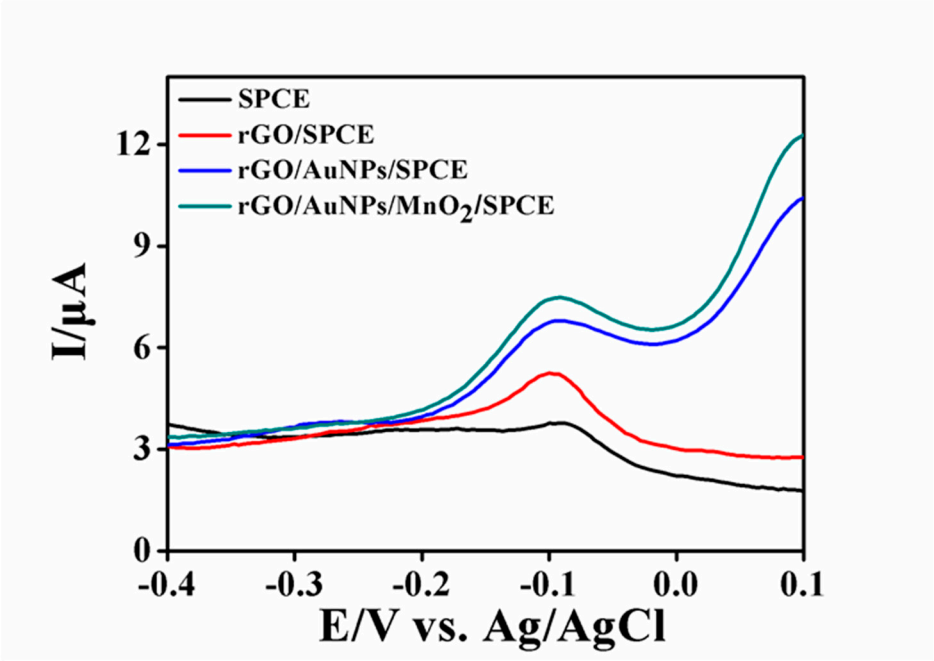

Figure S4. SWASV responses for 100 ppb As(III) in 0.01 mol L^{-1} H_2SO_4 solution on the bare SPCE, rGO/SPCE, rGO/AuNPs/SPCE and rGO/AuNPs/MnO_2/SPCE. Deposition potential: –1.4 V; deposition time: 180 s.

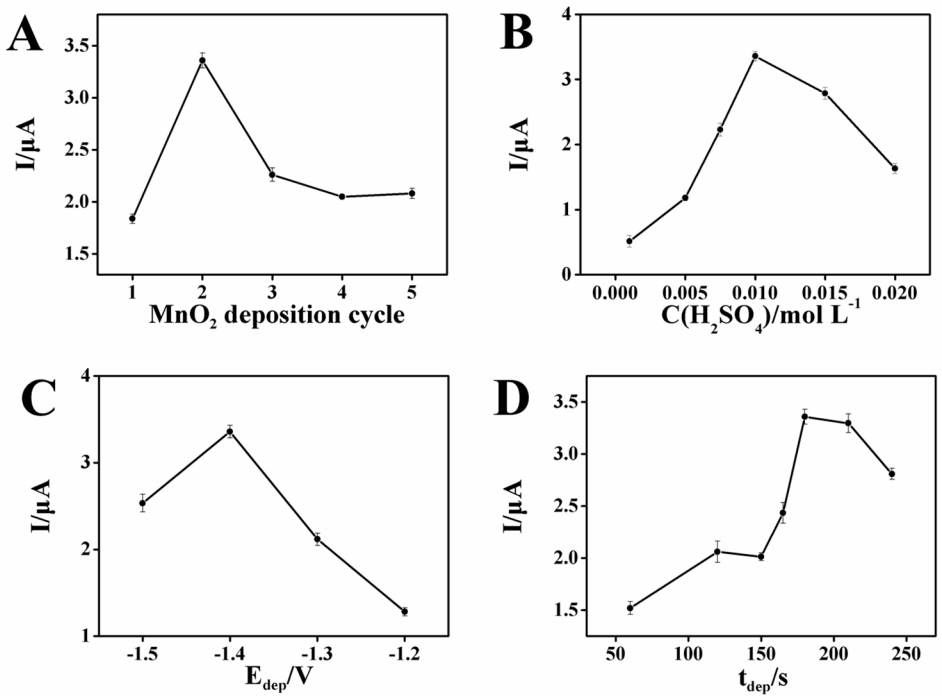

Figure S5. The influences of deposition cycles for MnO_2(A), pH(B), deposition potential(C) and deposition time(D) on the stripping peak current of 100 ppb As(III).

Table S1. The reproducibility of as-prepared SPCE-based sensor for the detection of As(III)(n=3).

Sample number	Concentration of As(III) (μg L^{-1})	Run-to-run RSD (%)	Batch-to-batch RSD (%)
1	50	3.5	4.9
2	100	4.1	4.4
3	150	5.0	4.3