Development of a Novel Nitrite Electrochemical Sensor by Stepwise in situ Formation of Palladium and Reduced Graphene Oxide Nanocomposites

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Supplementary Materials

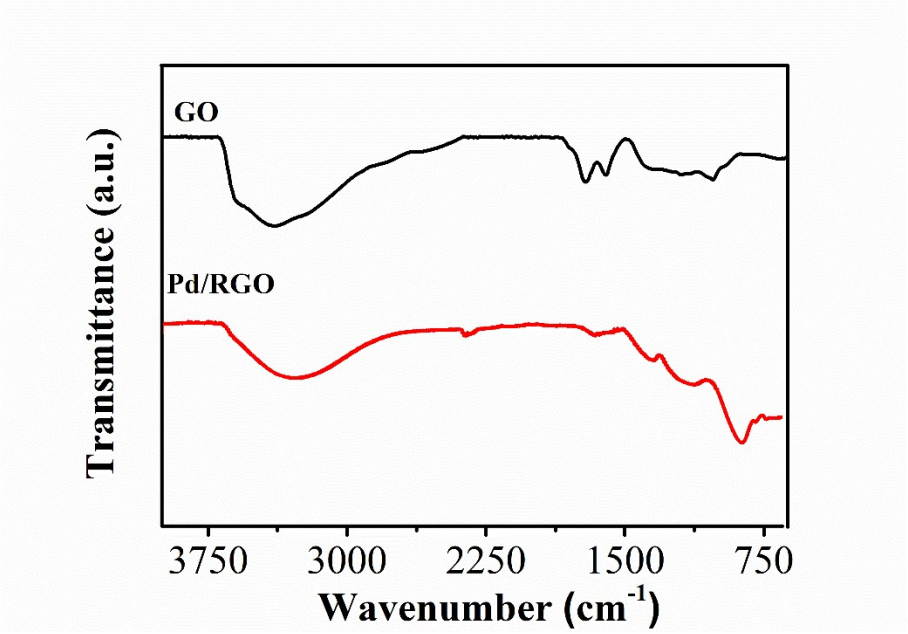

Figure S1. FTIR spectra of GO and Pd/RGO composite.

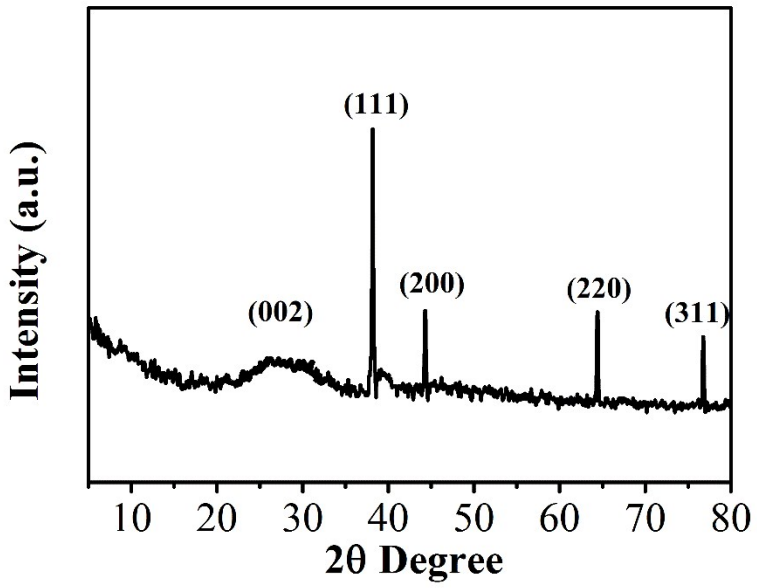

Figure S2. XRD pattern for Pd/RGO composites.

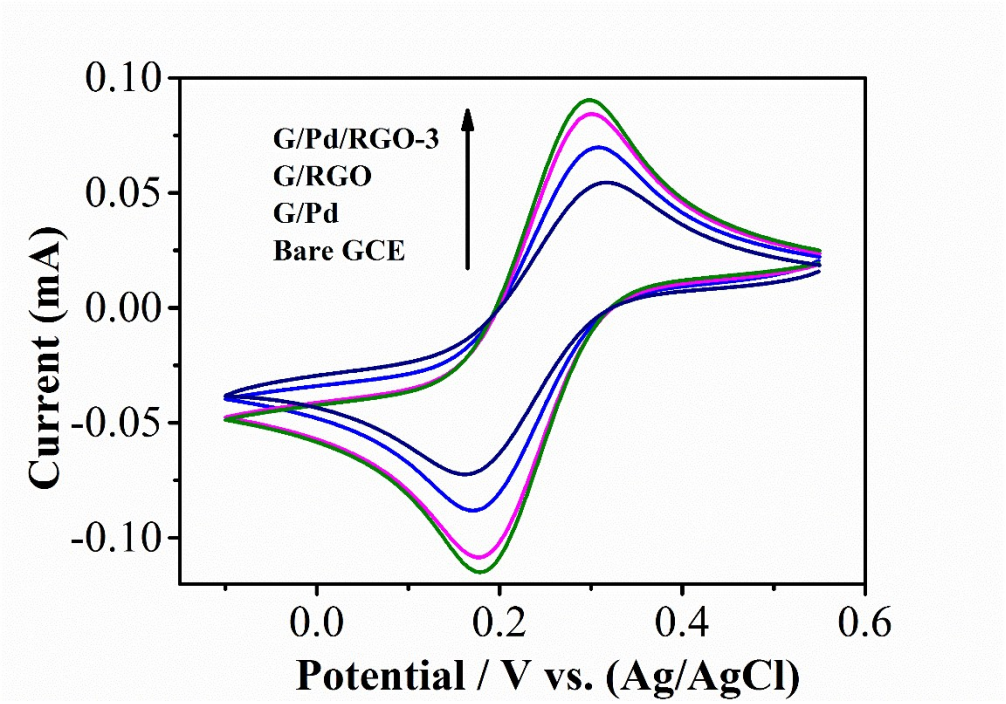

Figure S3. Cyclic voltammograms of bare, G/Pd, G/RGO and G/Pd/RGO-3 in 0.1 M KCl containing 1 mM $[Fe(CN)6]^{4-}$. Scan rate: 20 mV/s.

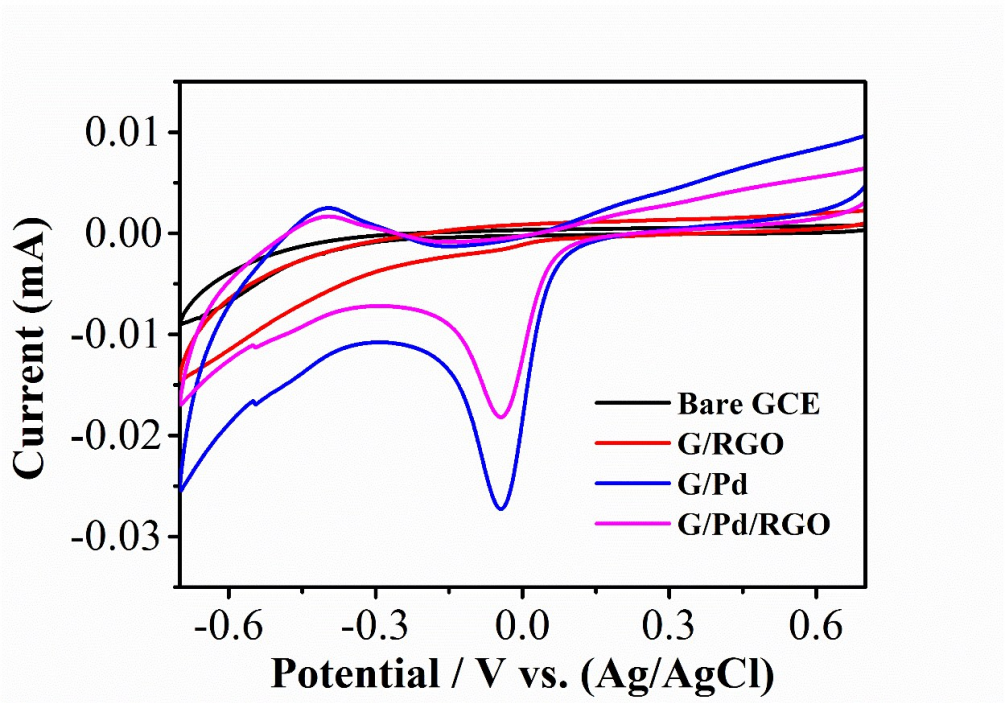

Figure S4. Cyclic voltammograms of bare, G/Pd, G/RGO and G/Pd/RGO-3 in 0.1 M PBS (pH = 7.0). Scan rate: 50 mV/s.

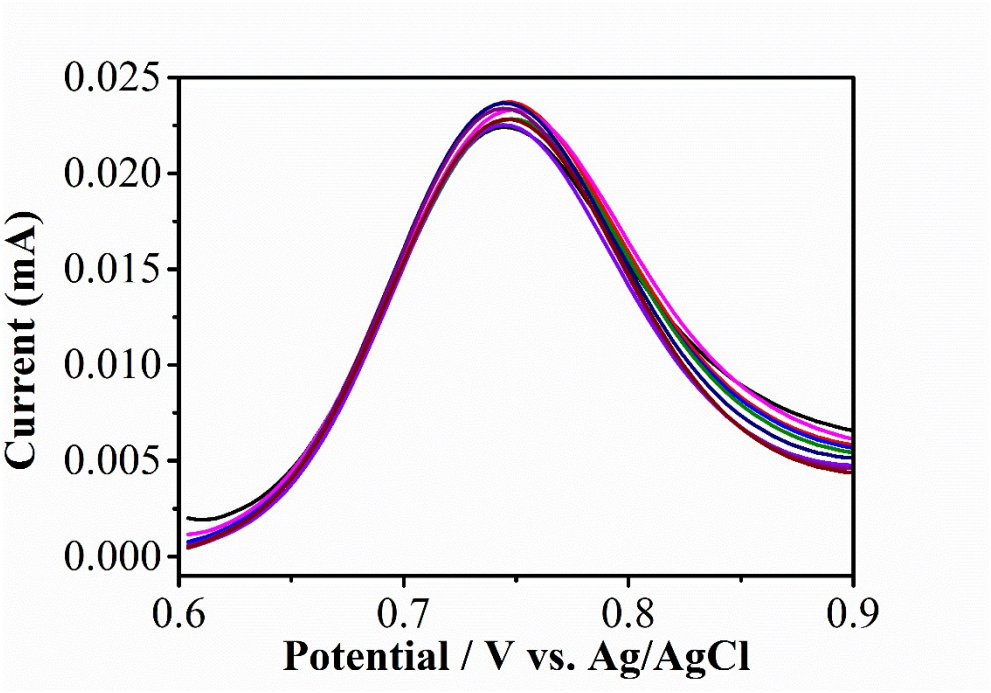

Figure S5. Differential pulse voltammograms at the G/Pd/RGO-3 for eight successive repetitive measurement of 1 mM nitrite.

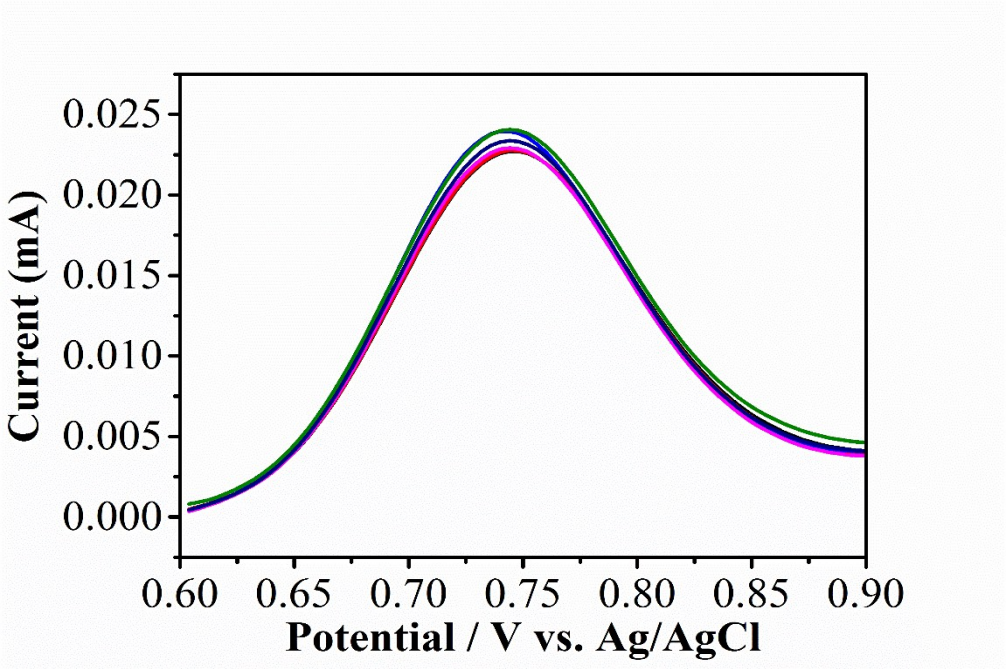

Figure S6. Differential pulse voltammograms of six G/Pd/RGO-3 electrodes for detecting 1 mM nitrite.

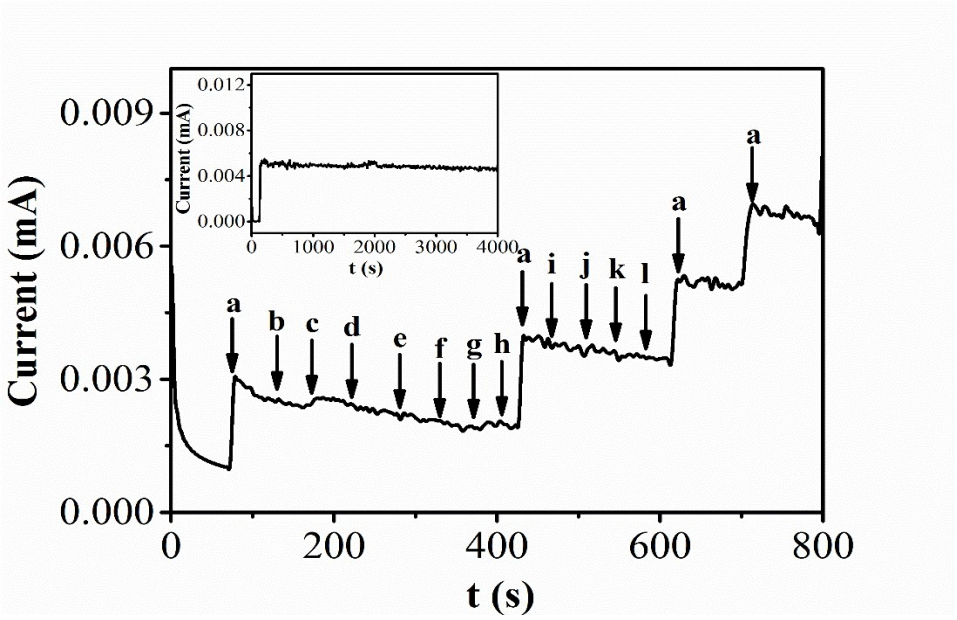

Figure S7. *I*-t curve recorded on the G/Pd/RGO-3 in the PBS by addition of 0.2 mM of (a) nitrite, 2 mM of (b) K^+, (c) Na^+, (d) Zn^{2+}, (e) SO_4^{2-}, (f) CO_3^{2-}, (g) NH_4^+, (h) HPO_4^{2-}, 1 mM of (i) glucose, (j) dopamine, (k) uric acid and (l) ascorbic acid at 0.8 V. Inset: *I*-t curve recorded on the G/Pd/RGO-3 in the PBS by addition of 0.4 mM of nitrite at 0.8 V for 4000 s.

Table S1 Performance comparison of the proposed G/Pd/RGO-3 electrode and electrodes reported by previous reports.

Electrode	Method	Potential (V)	LOD (μM)	Linear range(μM)	Reference
GC/MC	DPV	0.808	0.1	0.5-100	[1]
(p-NiTAPc) modified GCE	CV	0.86	0.9	2.5-1000	[2]
TiO_2/ND	DPV	0.73	0.55	50-1000	[3]
Thionine/ACNTs	DPV	0.8	1.12	3-500	[4]
GR/PPy/CS/GCE	I-t	0.9	0.1	0.5-722	[5]
GNPs/MWCPE	SWV	0.9	0.01	0.05-250	[6]
G/Pd/RGO	DPV	0.75	0.23	1-1000	This work

GC = Glassy carbon; MC = chitosan-carboxylated multiwall carbon nanotube; ND = Nanodiamond; ACNTs = Aligned carbon nanotubes; GR/PPy/CS = graphene/polypyrrole/chitosan; GNPs/MWCPE = gold nanoparticles/multi-walled carbon nanotube/carbon paste electrode

References

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