Electronic Supplementary Material (ESI) for Analytical Methods

Supplementary Material

Graphene Impregnated with Horseradish Peroxidase Multimer for the Determination of Hydrogen Peroxide

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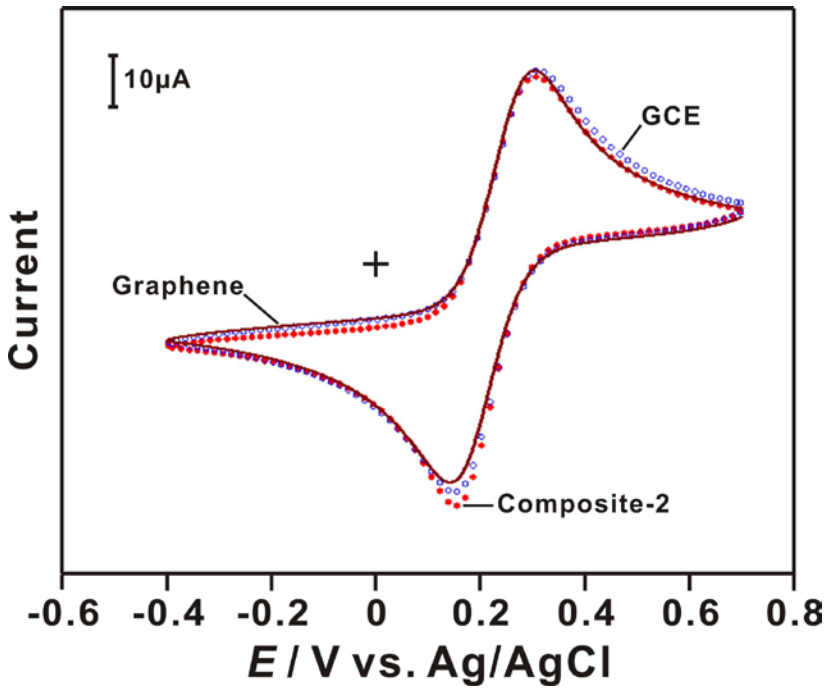

Fig. S1. Cyclic voltammograms of bare GCE, graphene and composite-2 modified GCEs in 5mM $[Fe(CN)_6]^{3-/4-}$ in PBS at 50 mV s^{-1}.

Raman Spectroscopy Characterization

The Raman spectrum of graphene shows the D band (due to defect mediated zone-edge phonons) at 1348 cm^{-1} and the G band (due to doubly degenerate E_2g mode at the Brillouin zone

centre) at 1588 cm^{-1} respectively, with the ratio of intensity (I_D/I_G) is ~1. The 2D and S3 bands appear at 2725 and 2930 cm^{-1} respectively. All these characteristic bands reveal the authenticity of graphene.

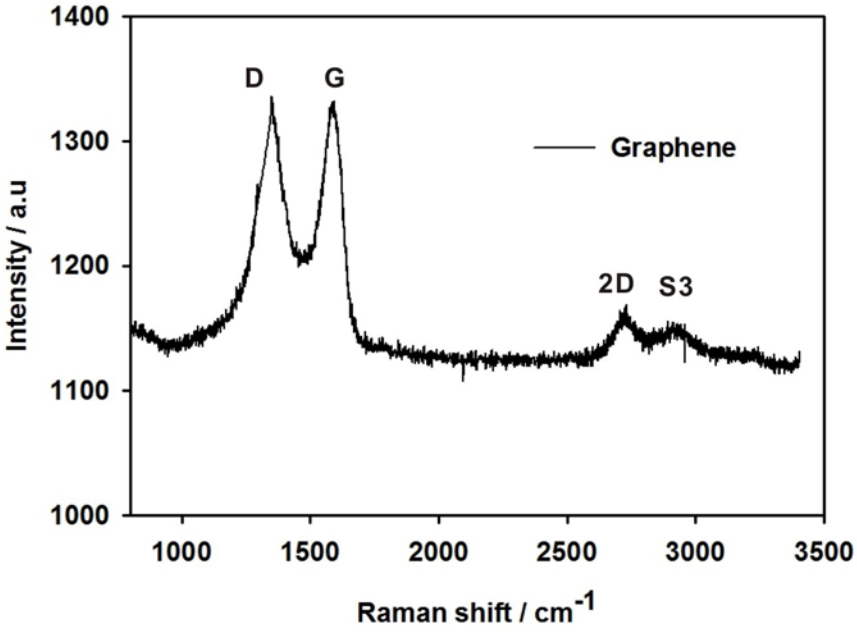

Fig. S2. Raman spectrum of graphene.

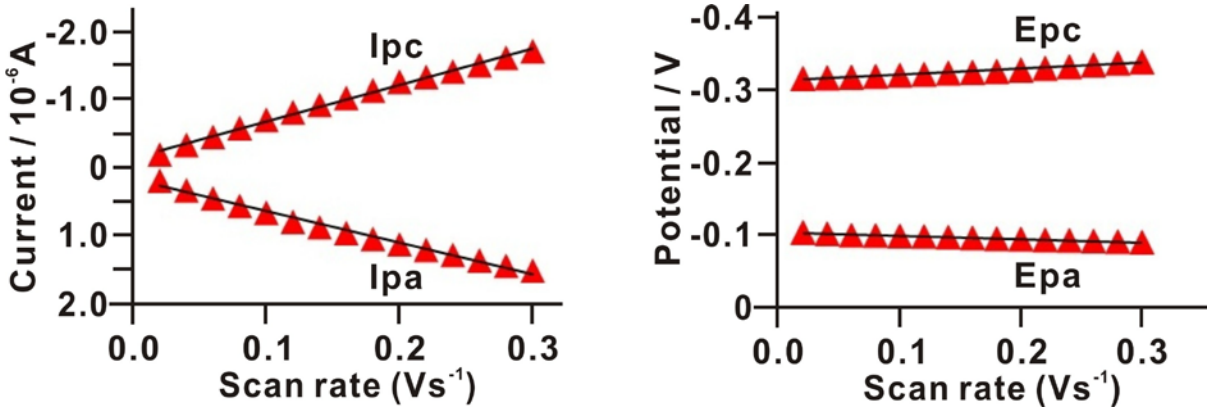

Fig. S3. Graph at the left shows the plot of peak current vs. scan rate for composite-3 film in PBS. Graph at the right shows the plot of peak potential vs. scan rate for composite-3 film.

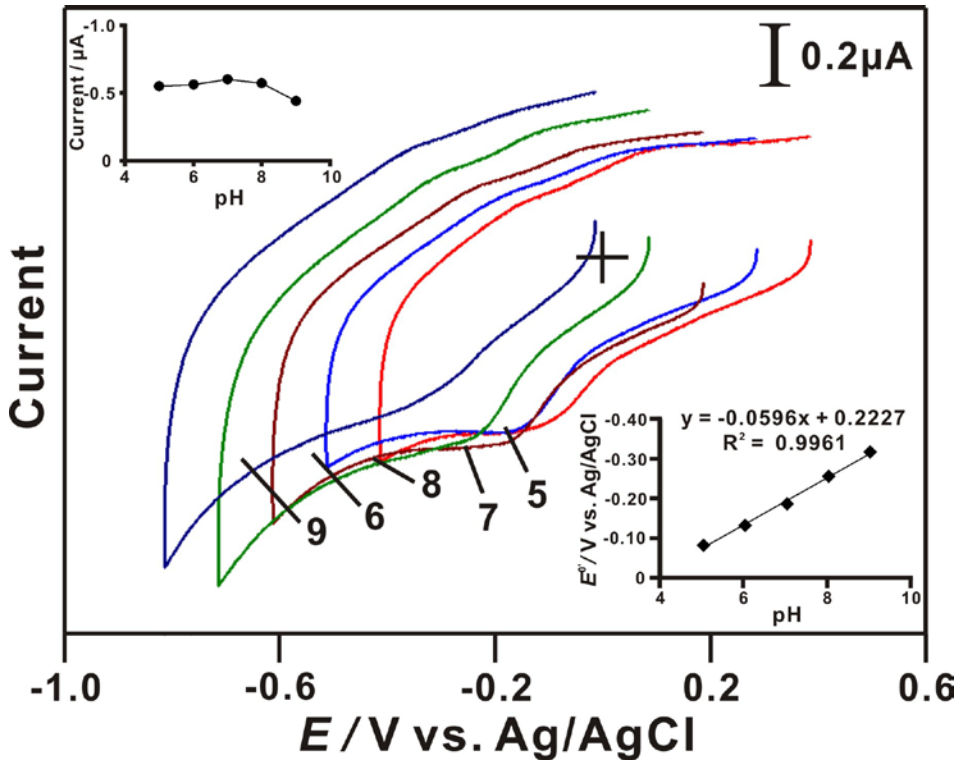

Fig. S4. Cyclic voltammograms of composite-3 film in various pH solutions (scan rate 50mVs^{-1}). The top inset shows the I_{pc} vs. pH. The bottom inset shows the formal potential $E^{0'}$ vs. pH.

Table S1. Selectivity of composite-3 film on H_2O_2 reduction in presence of various interfering compounds.

Interfering compound	**pH**	**Interference on I_{pc} of H_2O_2 (μA mM^{-1})** [a]
Ascorbic acid	7.0	0.9
Acetic acid	7.0	0.4
Uric acid	7.0	0.7
Dopamine	7.0	0.4

[a] Concentrations used for the experiments were 0.22 μM of H_2O_2 with 0.2 mM of interfering analytes, but converted to μA mM^{-1}.