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Supplementary Material

Electropolymerization of cobalt tetraamino-phthalocyanine at reduced graphene oxide for electrochemical determination of cysteine and hydrazine

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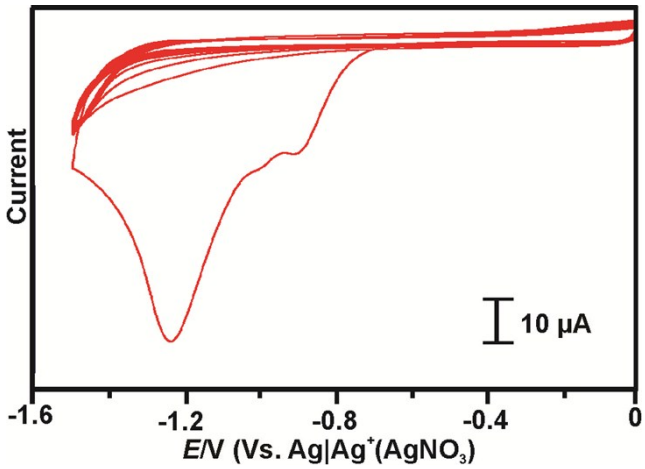

Fig. S1 Consecutive cyclic voltammograms obtained at GO/GCE in in DMSO containing 0.1 M TBAP for 20 cycles. Scan rate= 0.1 Vs^{-1}.

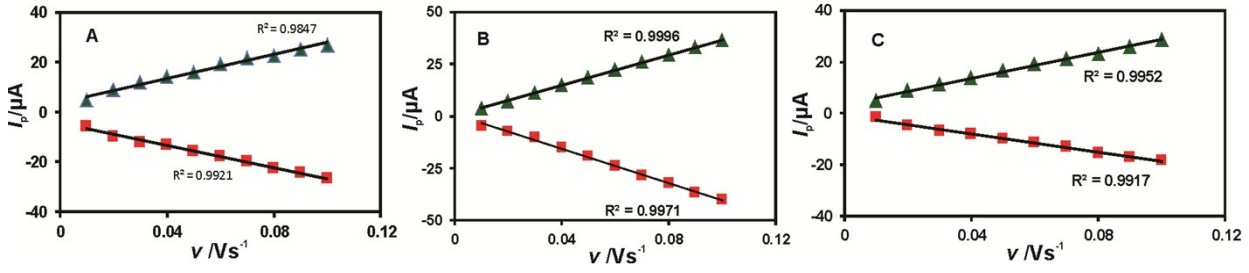

Fig. S2 The plot of I_{pa} and I_{pc} vs v for the redox couples. (A) Couple (1&2), (B) couple (3&4) and (C) couple (5&6). CVs obtained at RGO-*p*TACoPc/GCE in DMSO containing 0.1 M TBAP at increasing scan rates from 0.01 to 0.1 Vs^{-1}.

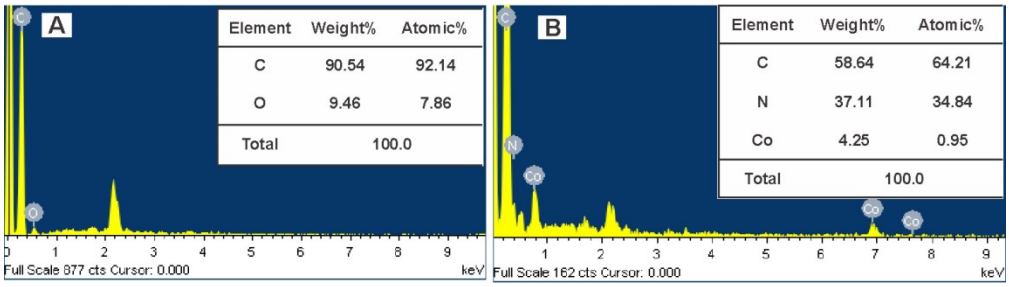

Fig. S3 EDX spectra of reduced graphene oxide (RGO) (A) and RGO-*p*TACoPc (B)

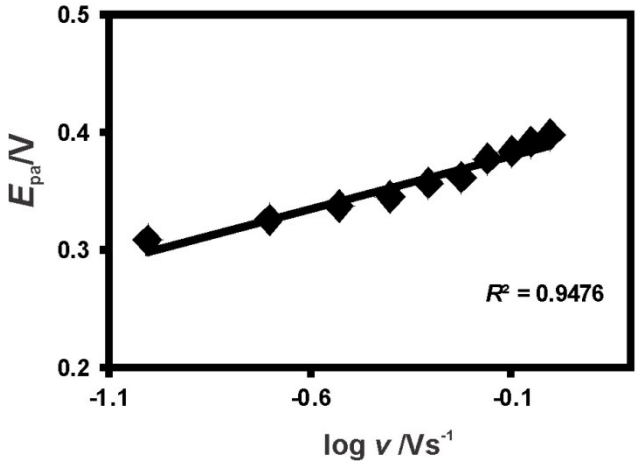

Fig. S4 Plot of log v vs. E_{pa}. CVs obtained at RGO-*p*TACoPc/GCE in phosphate buffer (pH 7) containing 0.5 mM of CySH at different scan rates (0.1 to 1 Vs^{-1}); E_{pa} (V) = 0.089 log v (Vs^{-1}) + 0.39.

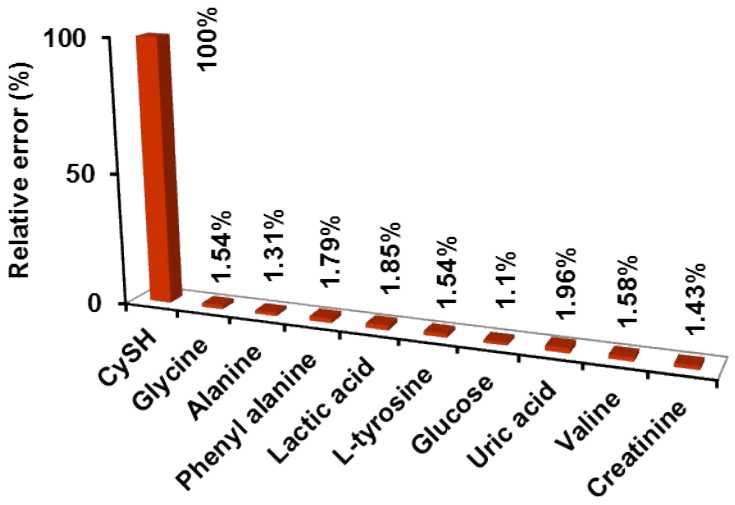

Fig. S5 Selectivity of the RGO-*p*TACoPc/GCE to detect CySH. Cyclic voltammograms were carried out using RGO-*p*TACoPc/GCE in phosphate buffer (pH 7) containing different species; 100 nM of CySH, while 500-fold excess concentration (each 50 μM) of glycine, alanine, phenylalanine, lactic acid, L-tyrosine, glucose, uric acid, valin, and creatinine.

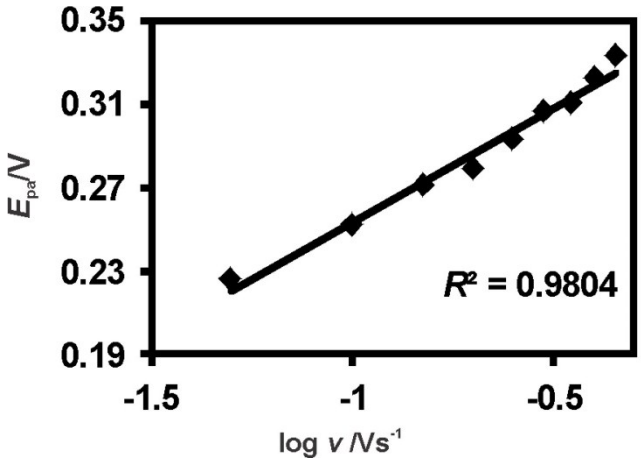

Fig. S6 Plot of log v vs. E_{pa}. CVs obtained at RGO-*p*TACoPc/GCE in phosphate buffer (pH 7) containing 1 mM hydrazine at different scan rates from 0.05 Vs^{-1} to 0.5 Vs^{-1}. E_{pa} (V) = 109.4 log v (Vs^{-1}) + 0.363.

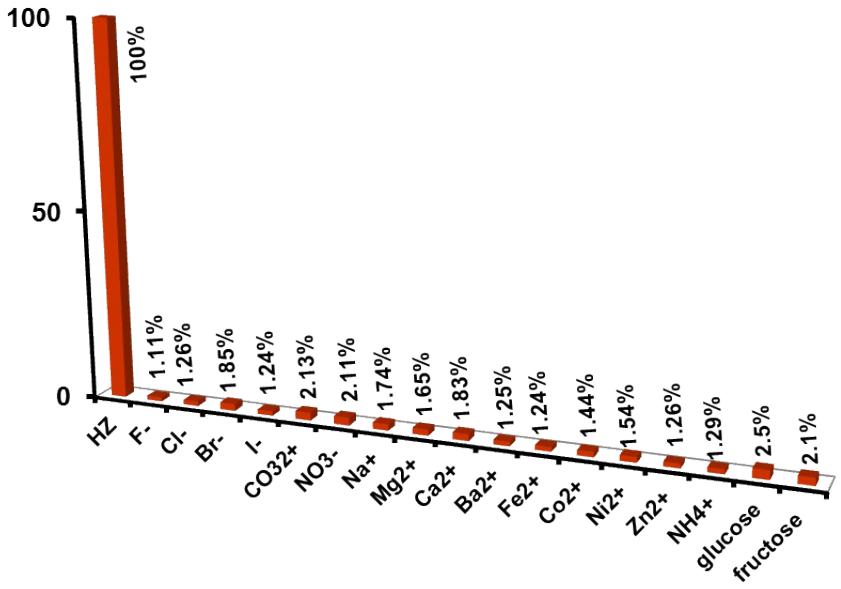

Fig. S7 Selectivity of the RGO-*p*TACoPc/GCE to detect hydrazine (HZ). Cyclic voltammograms were carried out using RGO-*p*TACoPc/GCE in phosphate buffer (pH 7) containing different species; 100 nM of hydrazine (HZ), while each 50 μM of F^-, Cl^-, Br^-, I^-, CO_3^{2-}, NO_3^-, NO_2^-, Na^+, Mg^{2+}, Ca^{2+}, Ba^{2+}, Fe^{2+} , Co^{2+}, Ni^{2+}, Zn^{2+}, NH_4^+, glucose and fructose (500-fold of HZ concentration).

Table S1 Electrochemical parameters for the oxidation of CySH at various modified electrodes

Electrodes	E_{pa}/V	j_{pa}/mA cm^{-2}
unmodified GCE	-	-
RGO/GCE	-	-
*p*TACoPc/GCE	0.30	0.267
RGO-*p*TACoPc/GCE	0.15	1.339

Table S2 Determination of CySH at RGO-*p*TACoPc/GCE in human serum sample

Sample	Added (μM)	Found (μM)	Recovery (%)	RSD (%)

1	50	49.4	98.8	2.5
2	100	98.5	98.5	2.3

Table S3. Determination of hydrazine in rain and tap water at the RGO-*p*TACoPc/GCE

Samples	Added (μM)	Found (μM)	Recovery (%)	RSD* (%)
Rain water	50	49.4	98.8	2.2
	100	98.7	98.7	2.4
Tap water	50	49.0	98	2.2
	100	99.1	99.1	2.7

* Relative Standard Deviation of 3 individual measurements.