

Supplementary Information

Amperometric Electrochemical Platform for Hydrazine Determination Exploiting Reduced Graphene Oxide, Co(Salophen) and DNA: Application in Pharmaceutical Formulations Samples

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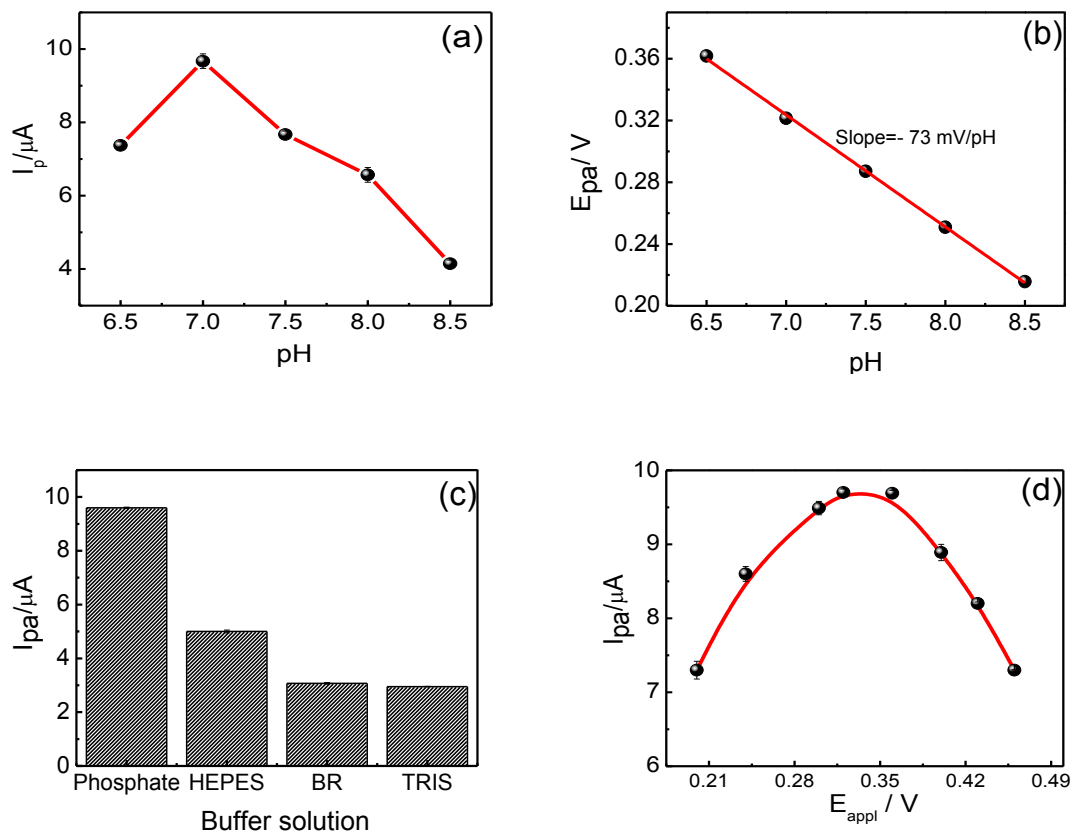


Figure S1. Influence of the solution pH on the current peak (a) and peak potential for 0.3 mmol L^{-1} HZ (b). Influence of the buffer solution (c) and applied potential (d) on amperometric response of the sensor (d). Measurements carried out in 0.1 mol L^{-1} buffer solution, pH 7. $\nu = 0.025 \text{ V s}^{-1}$.

Table S1. Influence of concentration of Co(Salophen) with $[\text{rGO}] = 3.0 \text{ mg mL}^{-1}$ and graphene with $[\text{Co(Salophen)}] = 1 \text{ mmol L}^{-1}$ of the electrochemical oxidation of HZ (0.3 mmol L^{-1}). In both cases, 2 mg mL^{-1} of DNA was used. Electrochemical measurements were performed in 0.1 mol L^{-1} PBS pH 7.0, $\nu = 0.025 \text{ V s}^{-1}$

Co(Salophen) / (mmol L^{-1})	$I_p / \mu\text{A}$
0.01	1.20 ± 0.05
0.10	2.35 ± 0.02
1.00	9.73 ± 0.02
10.00	4.35 ± 0.03
100.00	1.07 ± 0.04
[rGO] / (mg mL^{-1})	$I_p / \mu\text{A}$
2.0	1.72 ± 0.01
2.5	7.23 ± 0.05
3.0	9.75 ± 0.02
3.5	4.33 ± 0.03
4.0	3.17 ± 0.05

Table S2. Comparison of the analytical performance using different modified electrodes for the electrocatalytic determination of HZ

Electrode	E_{ox} / V	Linear range / ($\mu\text{mol L}^{-1}$)	LOD / ($\mu\text{mol L}^{-1}$)
TiO ₂ /CNT ¹	0.40	0.35-122.8	0.22
MBCPE/Fe ₃ O ₄ NPs/DPB ²	0.25	0.1-40 0.7-12	0.018
CoHCF/GCE ³	0.66	0.25-100	1000
Pt ₅₀ -Cu ₅₀ @PSi/CILE ⁴	0.20	0.2-1680	0.05
AuPd/NRCs ⁵	-0.12	0.1-501	0.02
Au/NPs/CNTs/ErGO ⁶	0.21	0.3-319	0.065
ZrO ₂ NPs/Au ⁷	0.27	10-90	0.014
CuCo ₂ O ₄ /GCE ⁸	0.78	0.032-5000	0.008
HAP/rGO/CS/GCE ⁹	0.55	2.5-260	0.43
Ag/L-CPE ¹⁰	-0.05	10-400 400-4000	1.5
CoPc/carbon paste ¹¹	-0.32	125-980	73.5
GCE/TiO ₂ sheet ¹²	0.70	200-700	28
	0.65	100-700	150
CoPc/carbon paste ¹³	0.50	20-200	0.5
Au@Pd/CB-DHP/GCE ¹⁴	0.15	2.5-88.0	1.77
SnO ₂ -GG/ITO electrode ¹⁵	0.52	2000-22000	2760
Hb/ZnO/CNF/GCE ¹⁶	0.40	19.8-1710	6.8
CoOOH nanosheets ¹⁷	0.00	0.1-1200	20
Co/OEP/GCE ¹⁸	0.35	50.0-5000	51.8
rGO/Co(Salofen)/DNA/GCE (this work)	0.32	2-364	0.54

LOD: limit of detection; TiO₂: titanium oxide; CNT: carbon nanotube; MBCPE: magnetic bar carbon paste electrode; NPs: nanoparticles; DPB: 2-(3,4-dihydroxyphenyl) benzothiazole; GCE: glassy carbon electrode; CILE: ionic liquid electrode; PSi: surface of porous silicone; NRC: nanorod chain; ErGO: reduced graphene oxide; HPA: hydroxyapatite; CB: carbon black; DHP: dihexadecylphosphate; GG: guar gum biopolymer; ITO: indium tin-oxide; Hb: hemoglobin; CNF: carbon nanofiber; OEP: octaethylporphyrins; DNA: deoxyribonucleic acid.

Table S3. Study of the selectivity of the proposed sensor with possible interfering in pharmaceutical samples

Interfering compound	[HZ] expected / ($\mu\text{mol L}^{-1}$)	[HZ] found / ($\mu\text{mol L}^{-1}$)	Relative response / %
Ascorbic acid	10.0	9.9 ± 0.1	99.0
Isoniazide	10.0	10.1 ± 0.3	101.0
Thiosulfate	10.0	9.8 ± 0.3	98.0
Rifampicin	10.0	9.9 ± 0.1	99.0
Magnesium stearate	10.0	10.0 ± 0.2	100.0

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