

Supplementary File

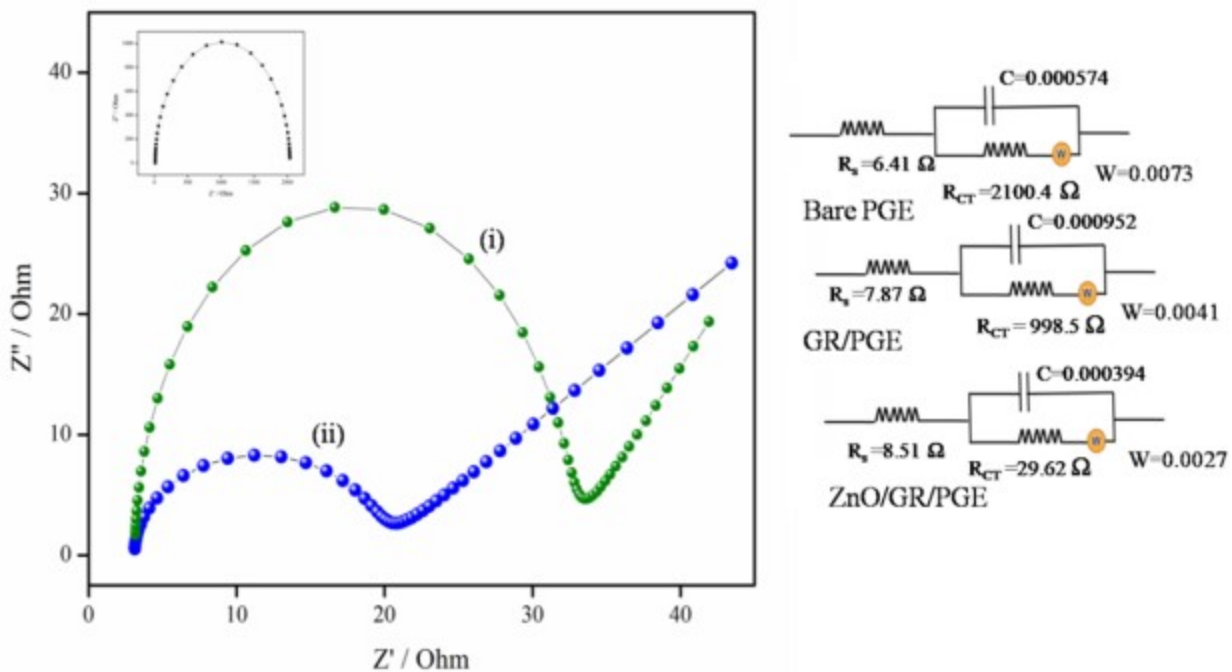


Fig. 1S. Nyquist plots of (inset) bare PGE, (i) GR/PGE, (ii) ZnO/GR/PGE in 1 mM $K_4[Fe(CN)_6]$ / $K_3[Fe(CN)_6]$ solutions containing 1 M KCl.

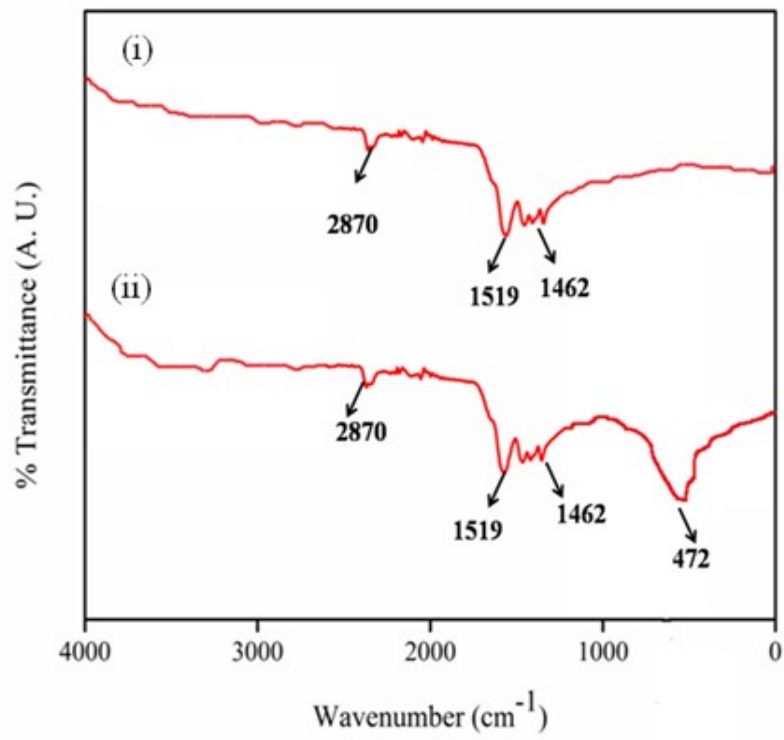


Fig. 2S. IR Spectrum of (i) GR/PGE and (ii) ZnO /GR/PGE.

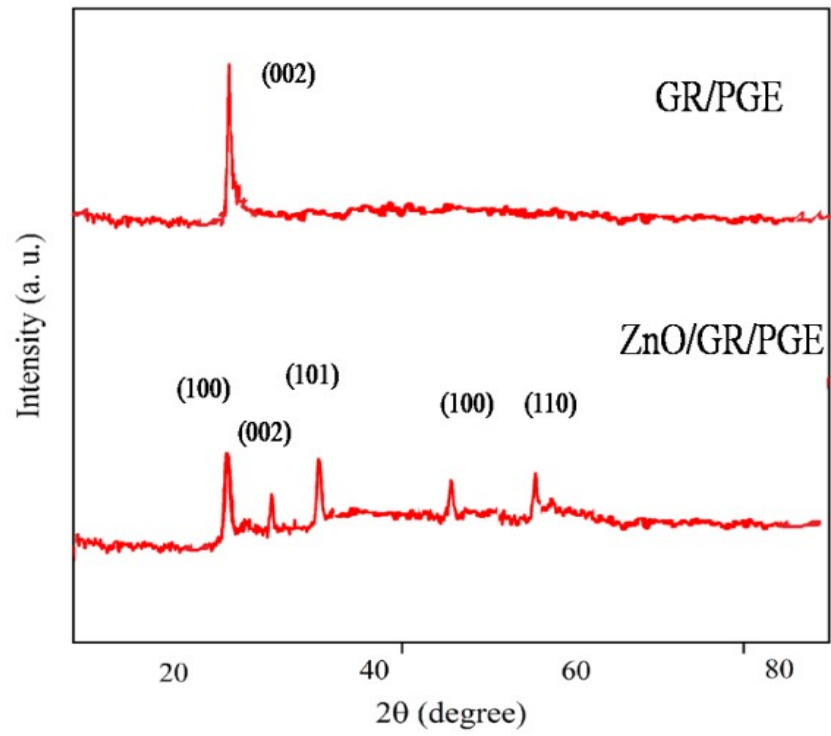


Fig. 3S. XRD patterns of GR/PGE and ZnO/GR/PGE

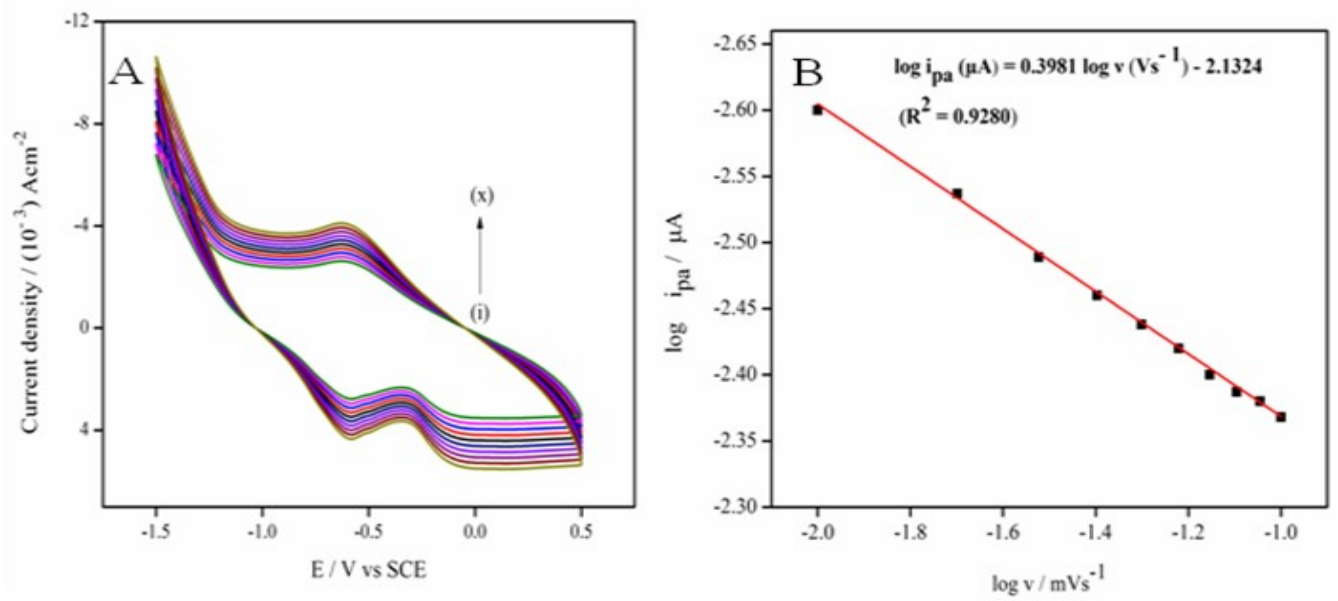


Fig. 4S. (A) Cyclic voltammograms of 6 nM Cortisol at ZnO/GR/PGE with varying scan rates from (i) 0.01 V/s (xi) 0.10 V/s (B) Plot of logarithm of cathodic peak currents against logarithm of scan rate.

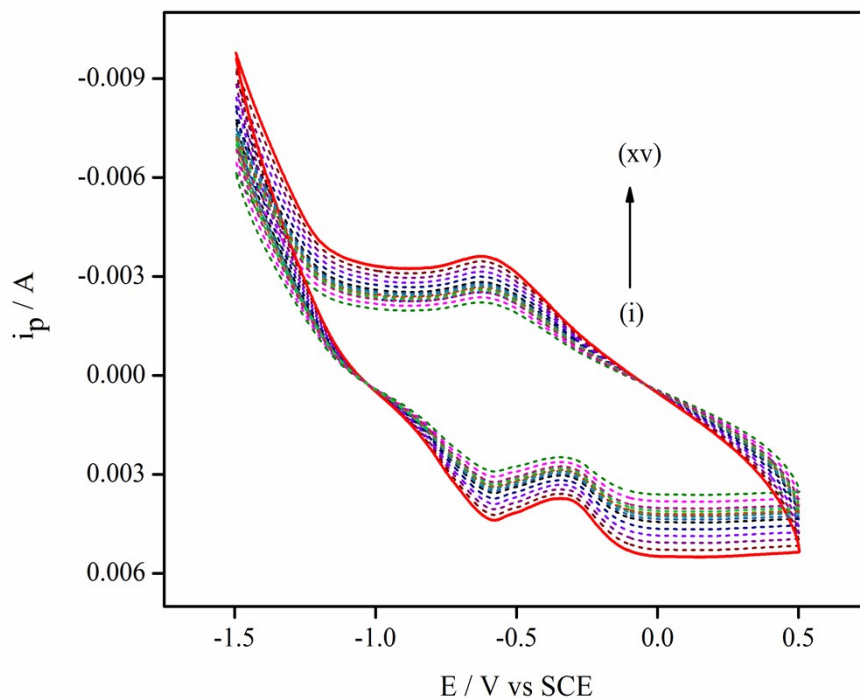


Fig. 5S. Effect of number of cycles on ZnO deposition on GR/PGE towards electrocatalytic detection of cortisol.

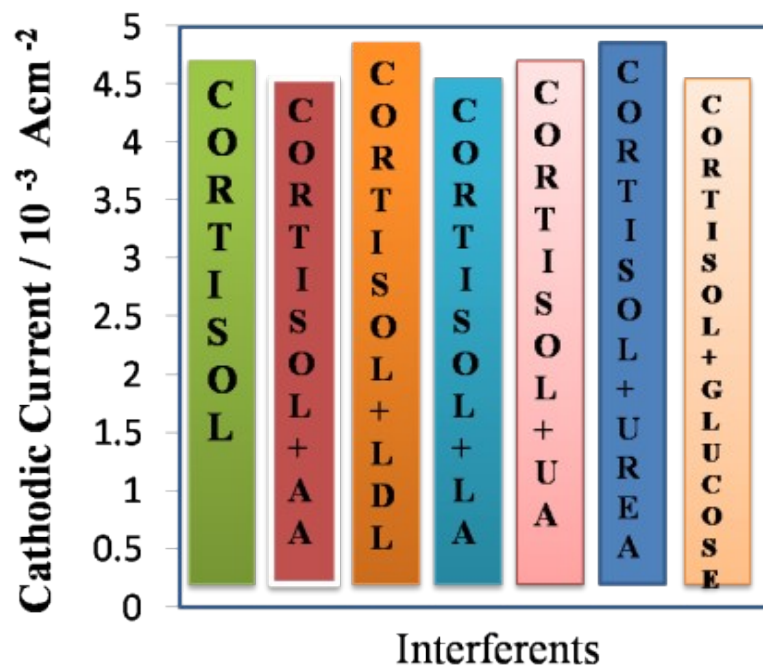


Fig. 6S. Variation in cathodic peak current of cortisol with the presence of different interferents

Table 1S. A comparative study of linear range and limit of detection for the determination of cortisol with other sensors.

Working electrode	Technique	Linear dynamic range	Limit of detection	Refs.
Ni-SPE	Electrochemical	0.25-25 μ M	74 nM	[1]
Molecularly cortisol imprinted acrylamide polymers on fullerene modified carbon electrode	Electrochemical	0.5 – 64 nM	0.14 nM	[2]
EA/CORT-Ab/SH-PEG-COOH/AuNPs/MoS ₂ /AuNPs modified immunosensor	Electrochemical	0.5-200 nM	0.11 nM	[3]
Au electrodes functionalized by alkaline phosphate enzyme	Electrochemical		0.76 nM	[4]
ZnO/GR/PGE	Electrochemical	5 x 10 ⁻¹⁰ M - 115 x 10 ⁻¹⁰ M	0.15 nM	Current work

Table 2S Reproducibility study of ZnO/GR/PGE

Working electrode	Cathodic potential (V)	Cathodic Peak current density (Acm ⁻²)	RSD (%)
ZnO/GR/PGE			
1	-0.58	3.78 x 10 ⁻³	0.72
2	-0.58	3.78 x 10 ⁻⁴	0.72
3	-0.585	3.76 x 10 ⁻³	0.78
4	-0.589	3.76 x 10 ⁻³	0.78
5	-0.592	3.73 x 10 ⁻³	0.86

- ^a Mean value of five determinations.
- Concentration of cortisol taken is 6 nM

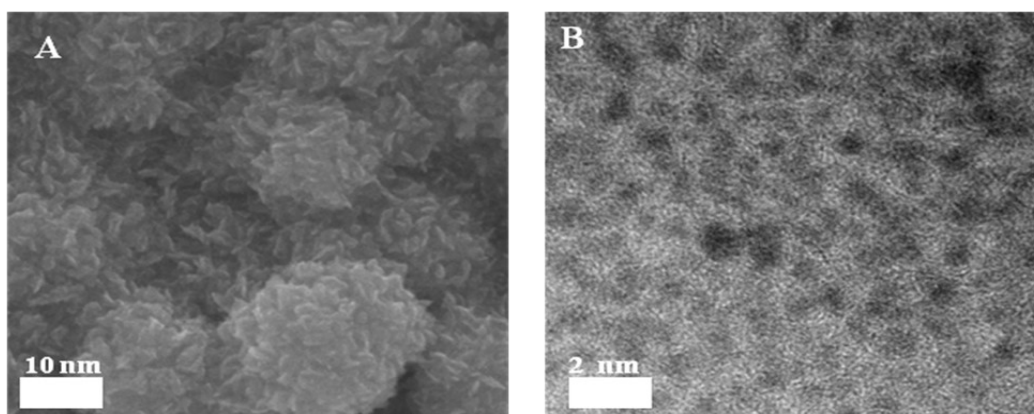


Fig 7S. (A) SEM image of ZnO/GR/PGE after cortisol detection and (B) TEM image of ZnO/GR/PGE after cortisol detection.

References

- 1 A. Gevaerd, E. Y. Watanabe, C. Belli, L. H. Marcolino-Junior and M. F. Bergamini, *Sens. Actuators, B*, 2021, **332**, 129532–129566, DOI: 10.1016/j.snb.2021.129532.
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