Electronic Supplementary Material (ESI) for RSC Advances.

Supplementary information

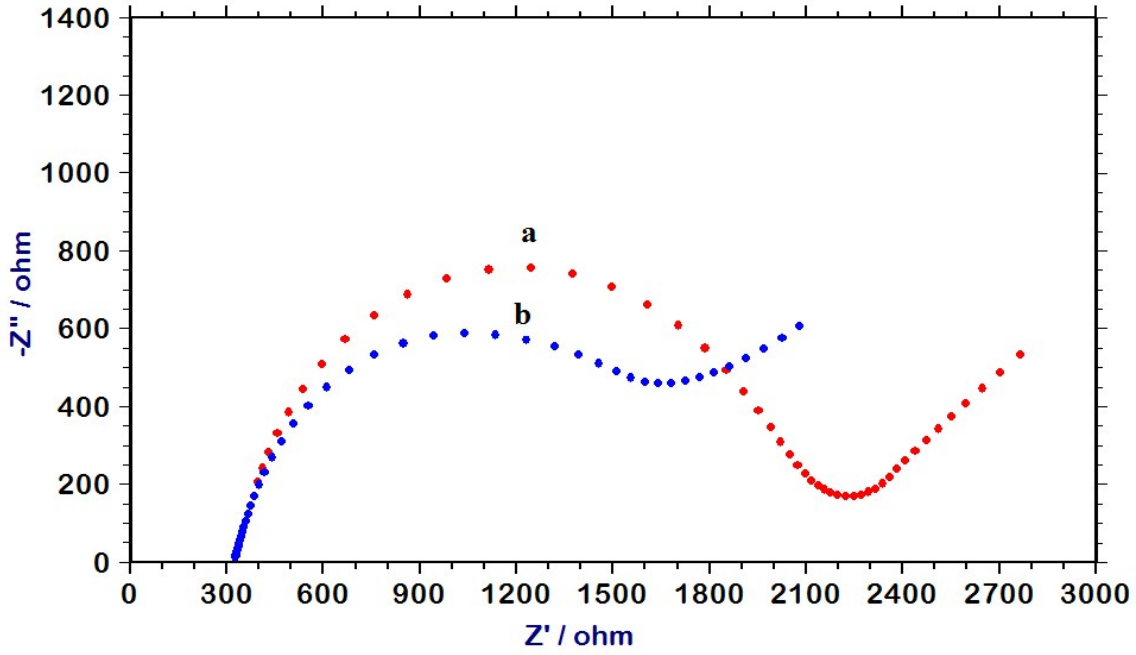

Fig.1. Overlay of Nyquist plots of (a) bare GCE (b) *p*-PTSA GCE in 5 mM $[Fe(CN)_6]^{3-/4-}$ in 0.1 M KCl at a frequency range 0.1 - 10^5 Hz

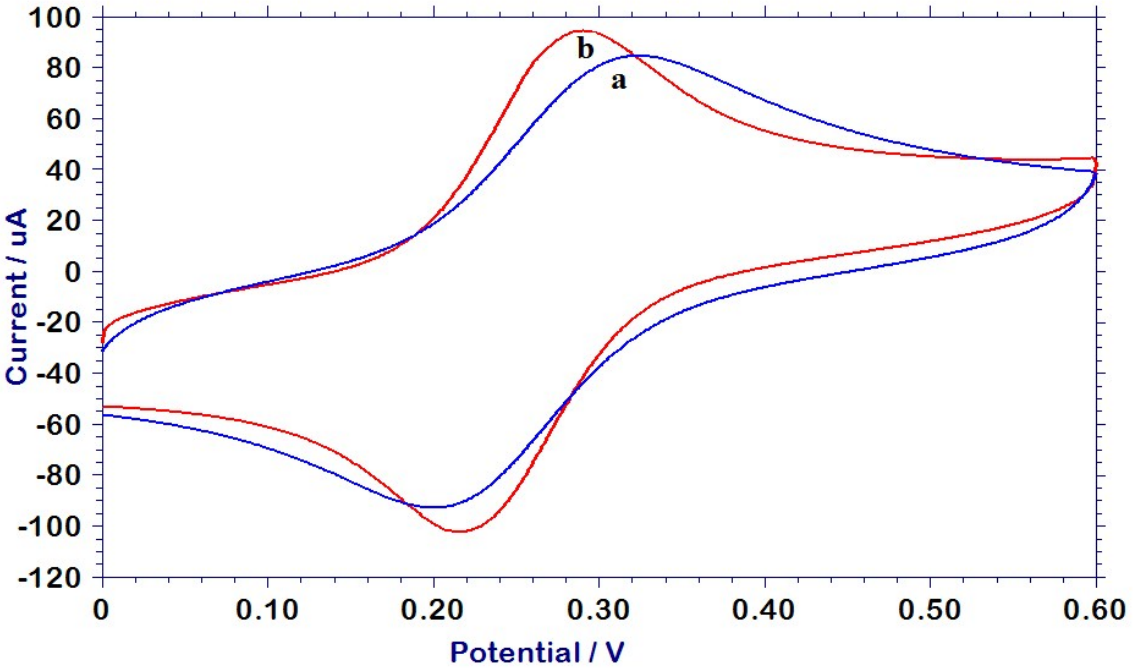

Fig. 2. Overlay of CV of (a) bare GCE (b) *p*-PTSA GCE in 2 mM $K_4[Fe(CN)_6]$ in 0.1 M KNO_3 at 100 mV s^{-1}

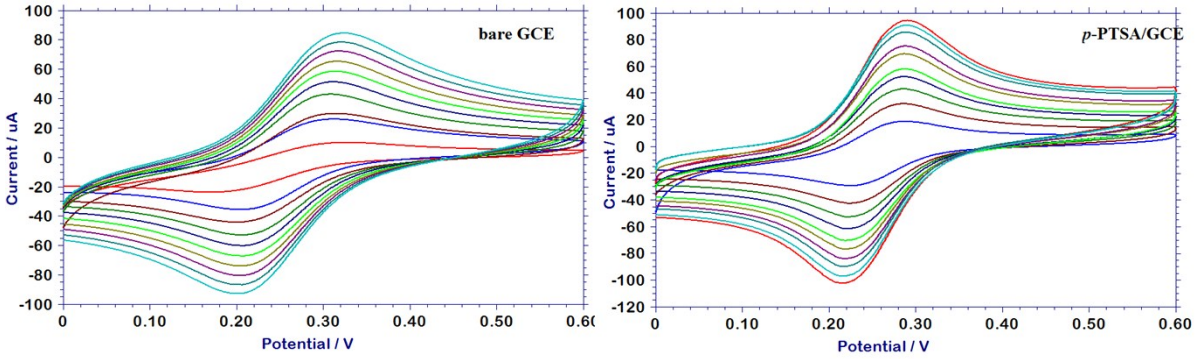

Fig. 3. Overlay of CV obtained in 2 mM $K_4[Fe(CN)_6]$ in 0.1 M KNO_3 at scan rates ranging from 10 mV s^{-1} to 100 mV s^{-1}

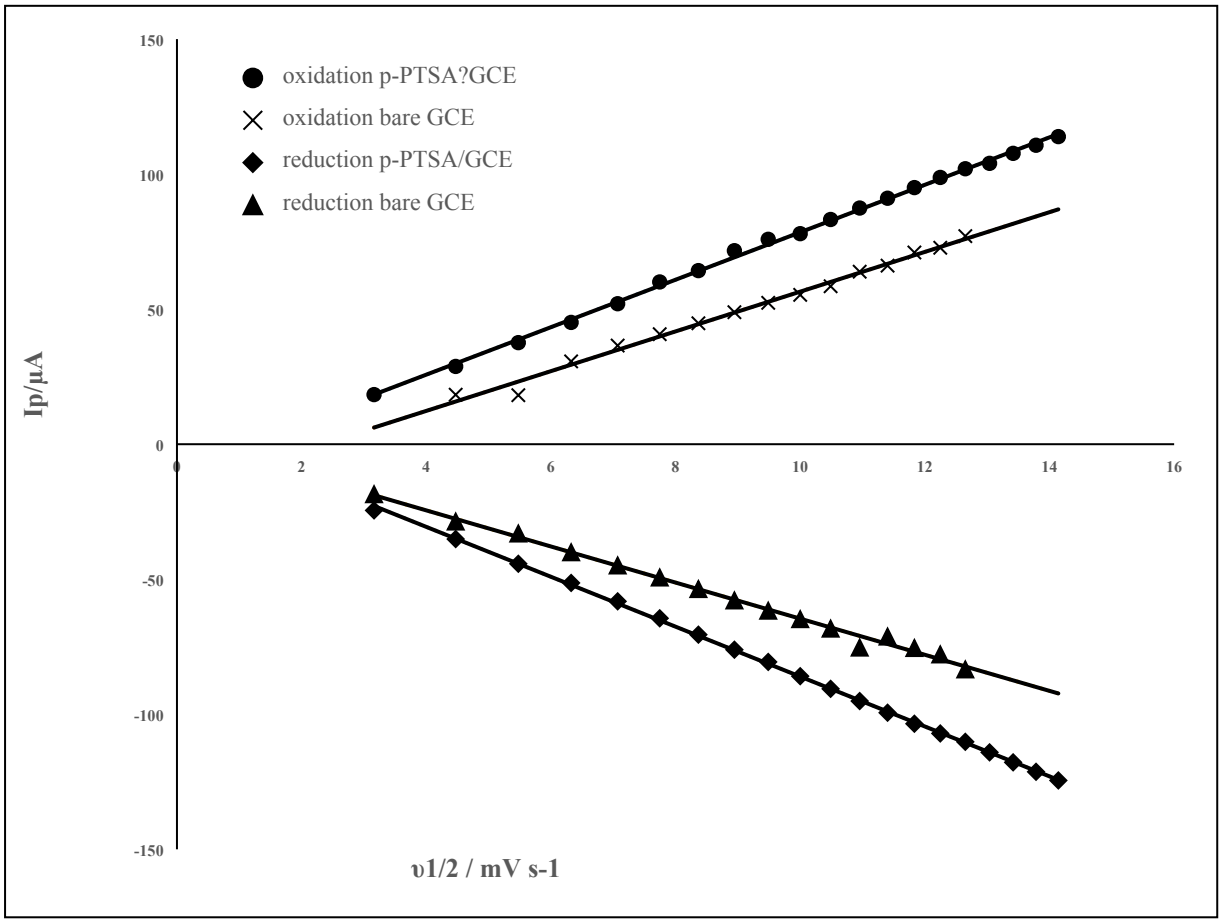

Fig. 4. Variation of peak current with square root of scan rate in the range 10 mV s^{-1}- 200 mV s^{-1}

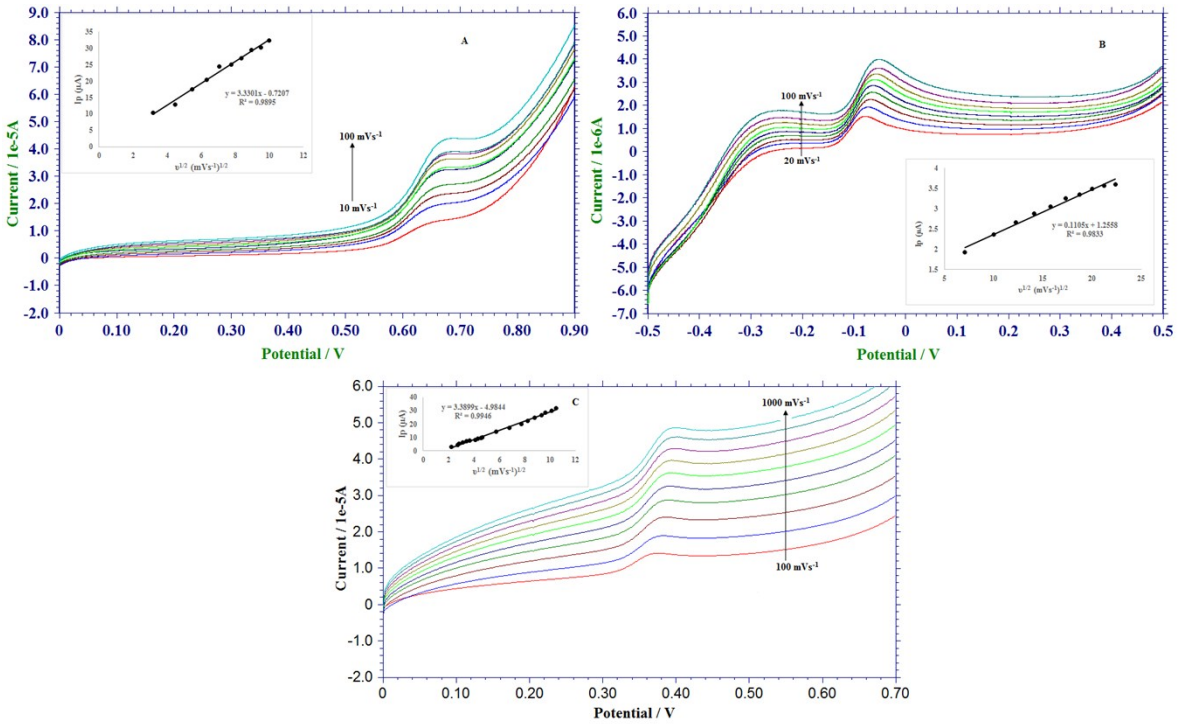

Fig. 5. Overlay of LSV of a solution of 0.1 M NaOH containing 500 µM of (A) Adenine (B) Uric Acid and (C) Guanine on *p*-PTSA GCE. Inset of each overlay shows the plot of peak current vs square root of scan rate

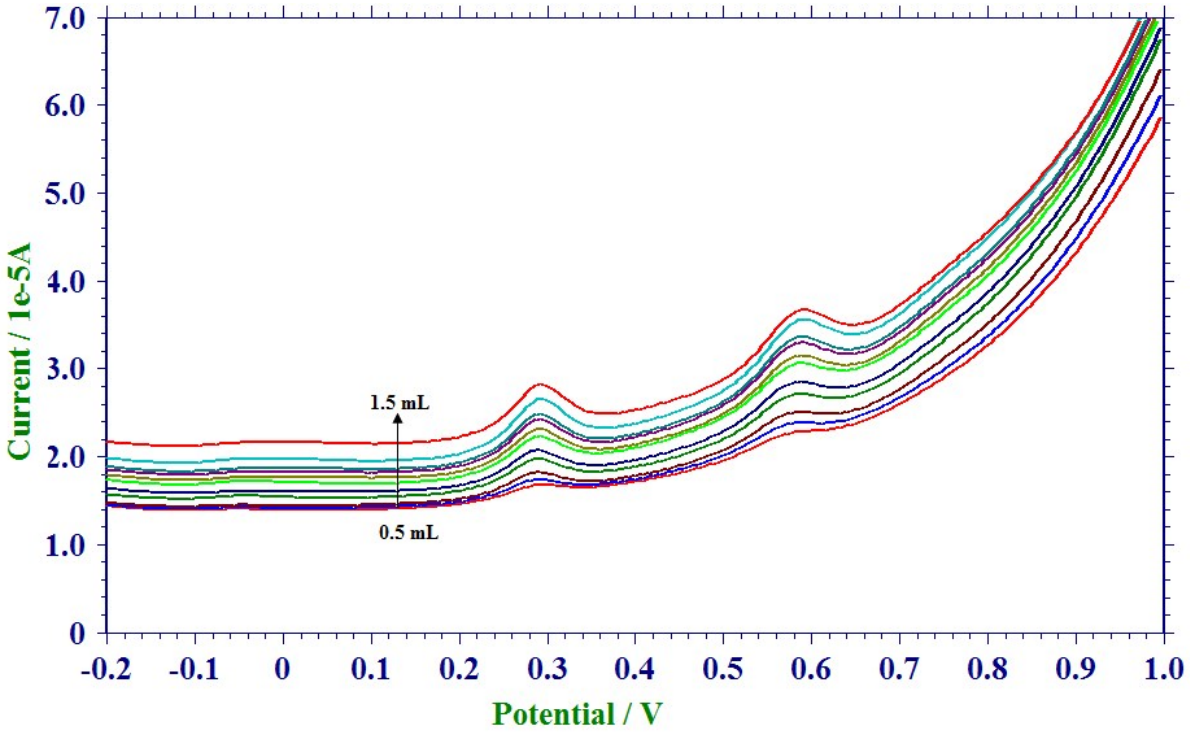

Fig.6. Overlay of SWV of 0.5 mL to 1.5 mL of 0.14 mg mL^{-1} of acid denatured HS DNA in 0.1 M NaOH obtained on *p*-PTSA/GCE.

Analyte	Linear Range	Regression equation	R^2	LOD µM
G	3 µM to 10 µM	*Ip* (µA) = - 8.09 + 3.95 C (µM)	0.9913	0.0079
	10 µM to 300 µM	*Ip* (µA) = + 28.5 + 0.76 *C* (µM)	0.9972	
A	5 µM to 45 µM	*Ip* (µA) = - 0.10 + 0.05 *C* (µM)	0.9934	0.94
	50 µM to 1500 µM	*Ip* (µA) = - 3.16 + 0.12 *C* (µM)	0. 9969	
UA	20 µM to 100 µM	*Ip* (µA) = - 1.12 + 0.08 *C* (µM)	0.9962	3.31
	90 µM to 1500 µM	*Ip* (µA) = +6.34 + 0.02 *C* (µM)	0.9941	
G (in presence of 100 µM of A and UA)	20 µM to 200 µM	*Ip* (µA) = +0.42 + 0.10 *C* (µM)	0.9985	3.08
	250 µM to 1000 µM	*Ip* (µA) = +10.7 + 0.04 *C* (µM)	0.9923	
A (in presence of 50 µM of G and UA)	10 µM to 120 µM	*Ip* (µA) = - 0.13 + 0.05 *C* (µM)	0.9950	3.16
UA (in presence of 100 µM of G and A)	20 µM -110 µM	*Ip* (µA) = + 0.64 + 0.06 *C* (µM)	0.9974	7.49
	100 µM - 1000 µM	*Ip* (µA) = + 3.35 + 0.03 *C* (µM)	0.9902	

Table 1. Statistical parameters for determination of the analytes

Electrode	Technique	Analyte	*Ep* (mV)	Linear range (µM)	LOD (µM)	Reference
Ag-PMel/GCE	SWV	G	850	0.1–50	.008	5
		A	1100	0.1–60	.008	
		UA	450	0.1–50	0.1	
PMel/GCE	SWV	G	840	0.1-50	.08	24
		A	1152	0.1-60	.07	
nano-Au/DNA/nano-Au/poly(SFR)/GCE	DPV	G	520	0.009–5.0	0.0005	6
		A	900	0.06–0.8	.004	
		UA	320	0.09–12	.008	
PImox–GO/GCE	DPV	G	880	3.3–103.3	0.48	12
		A	1200	9.6–215	1.28	
		UA	530	3.6–249.6	0.59	
PANI/MnO_2/GCE	DPV	G	610	10–100	4.8	22
		A	880	10–100	2.9	
p-PTSA/GCE	SWV	G	304	10-100	0.35	This work
		A	608	20-100	0.78	
		UA	-108	10-100	5.88	

Table 2. Comparison of the developed sensor with other recent polymer modified sensors based on GCE

Species	Concentration µM	Signal change (%)		
		Guanine	Adenine	Uric Acid
Cytosine	10	-1.1	-4.3	-2.5
Thymine	50	-2.0	-17.0	-4.9
Uracil	10	-0.1	-3.4	-4.5
Homovanillic Acid	50	-1.3	-10.0	-4.7
Dopamine	100	-6.8	-3.7	-2.9
Serotonin	10	> +20	-5.4	>+20
Melatonin	10	> +20	Peak disappears	Peak disappears
Glutathione	10	-0.8	-4.0	-4.3
Ascorbic Acid	50	-3.4	-8.3	Peak disappears
K^+	10	-1.3	+1.4	-9.9
Ca^+	10	+8.4	-1.3	-6.4

Table 3. Signal change produced by possibly co-existing species on the simultaneous determination of 10 µM G, A and UA