

Supplementary Material

for

Disposable and ultrasensitive label-free gold nanoparticle patterned poly(3,4-ethylenedioxythiophene-co-3-methylthiophene) electrode for electrochemical immunosensing of prostate-specific antigen

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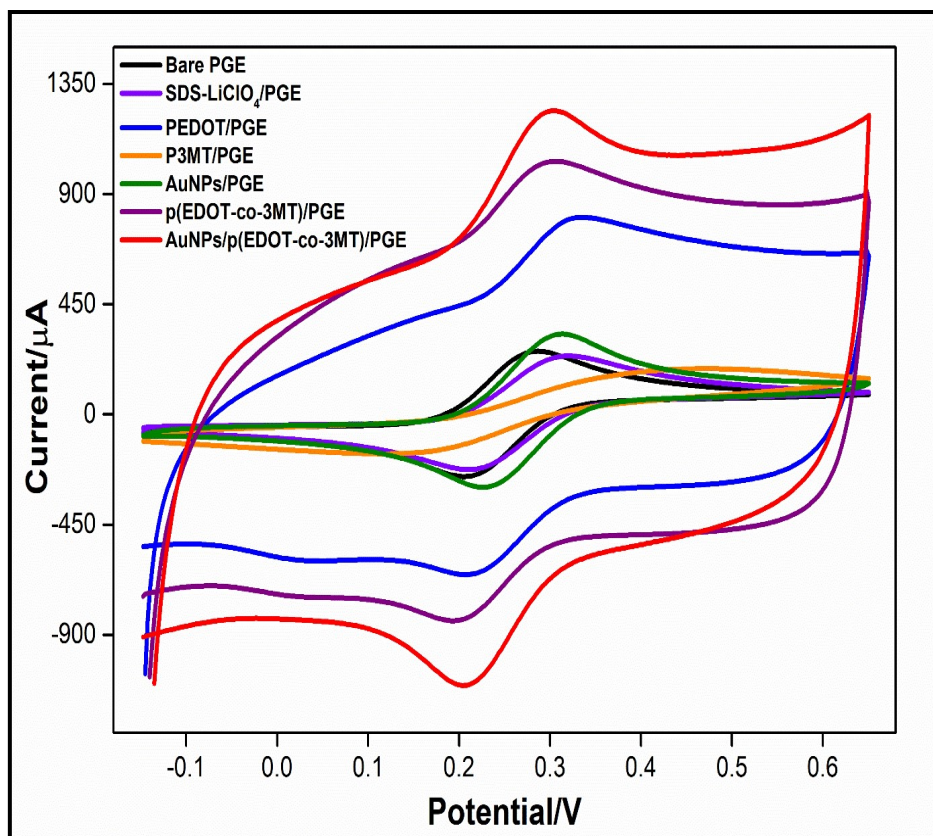


Fig. S1. Cyclic voltammograms of AuNPs/p(EDOT-co-3MT)/PGE, p(EDOT-co-3MT)/PGE, AuNPs/PGE, PEDOT/PGE, P3MT/PGE, SDS-LiClO₄/PGE and Bare PGE in 5.0 mM [Fe(CN)₆]^{3-/4-} solution.

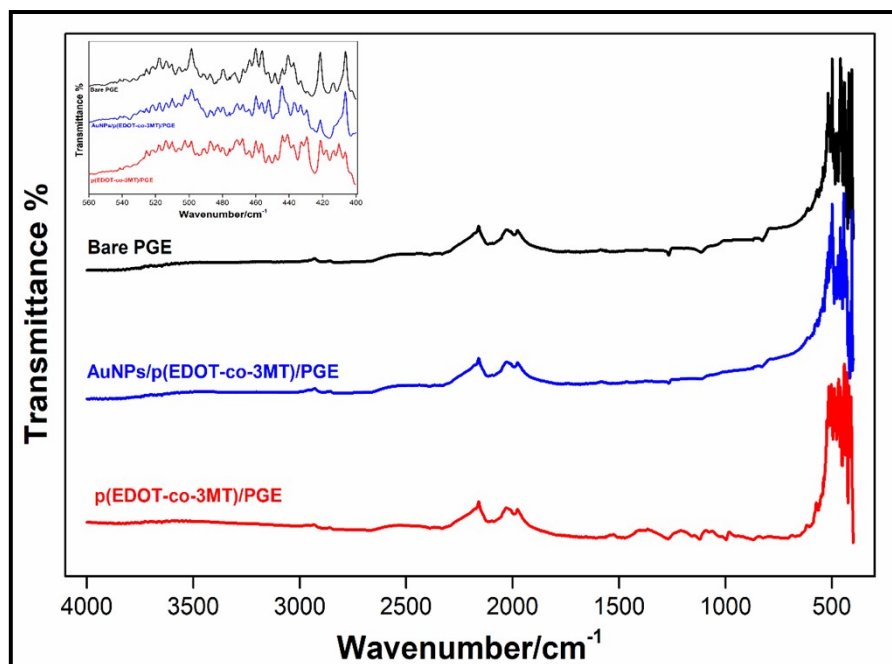


Fig. S2. FTIR spectra for bare PGE (black line), p(EDOT-co-3MT)/PGE (red line), and AuNPs/p(EDOT-co-3MT)/PGE (blue line) (inset: fingerprint region).

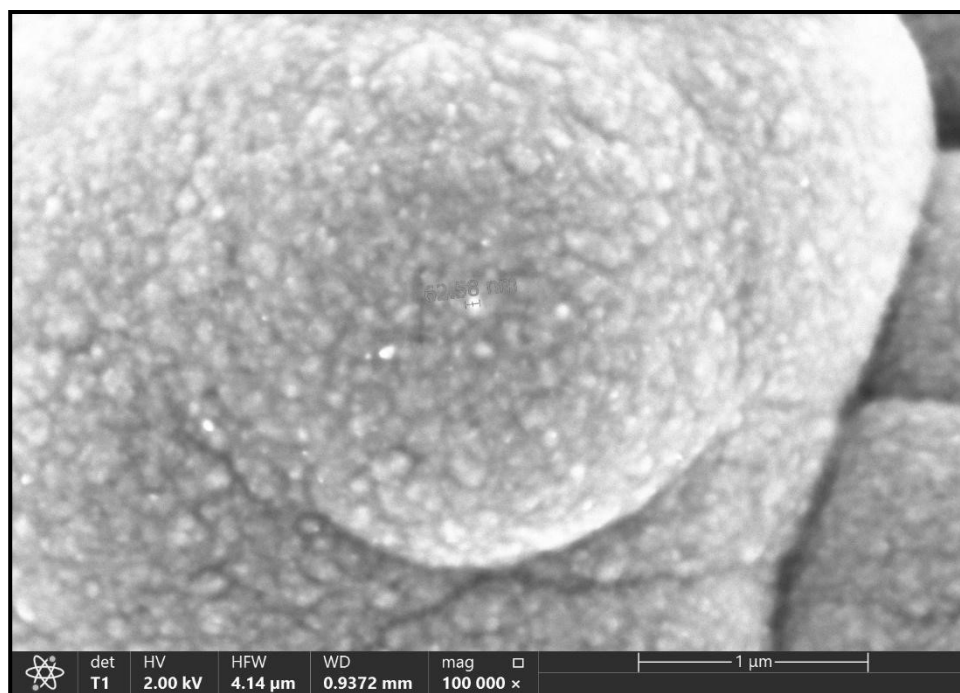


Fig. S3. FE-SEM micrograph of p(EDOT-co-3MT)/PGE at 100,000X magnification.

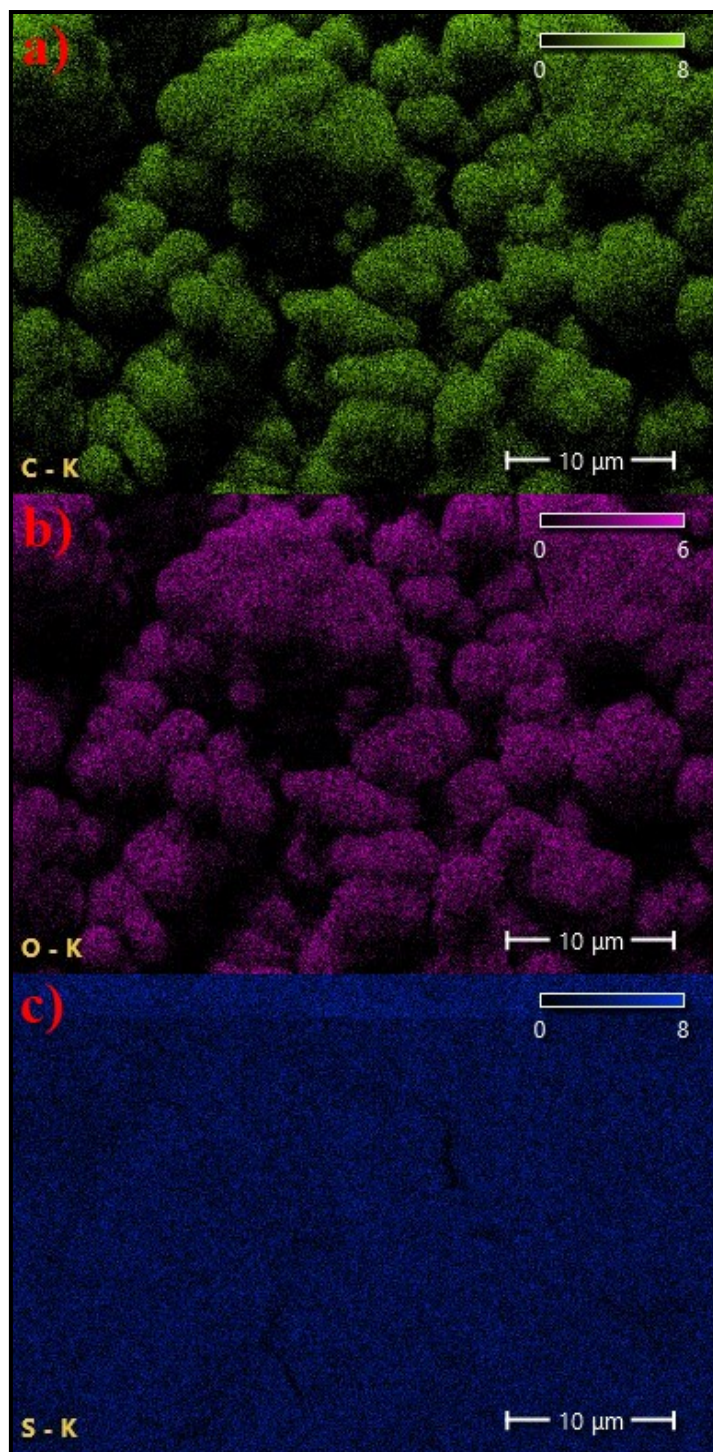


Fig. S4. EDS mapping analysis for **a)** C atom, **b)** O atom and **c)** S atom in the p(EDOT-co-3MT)/PGE.

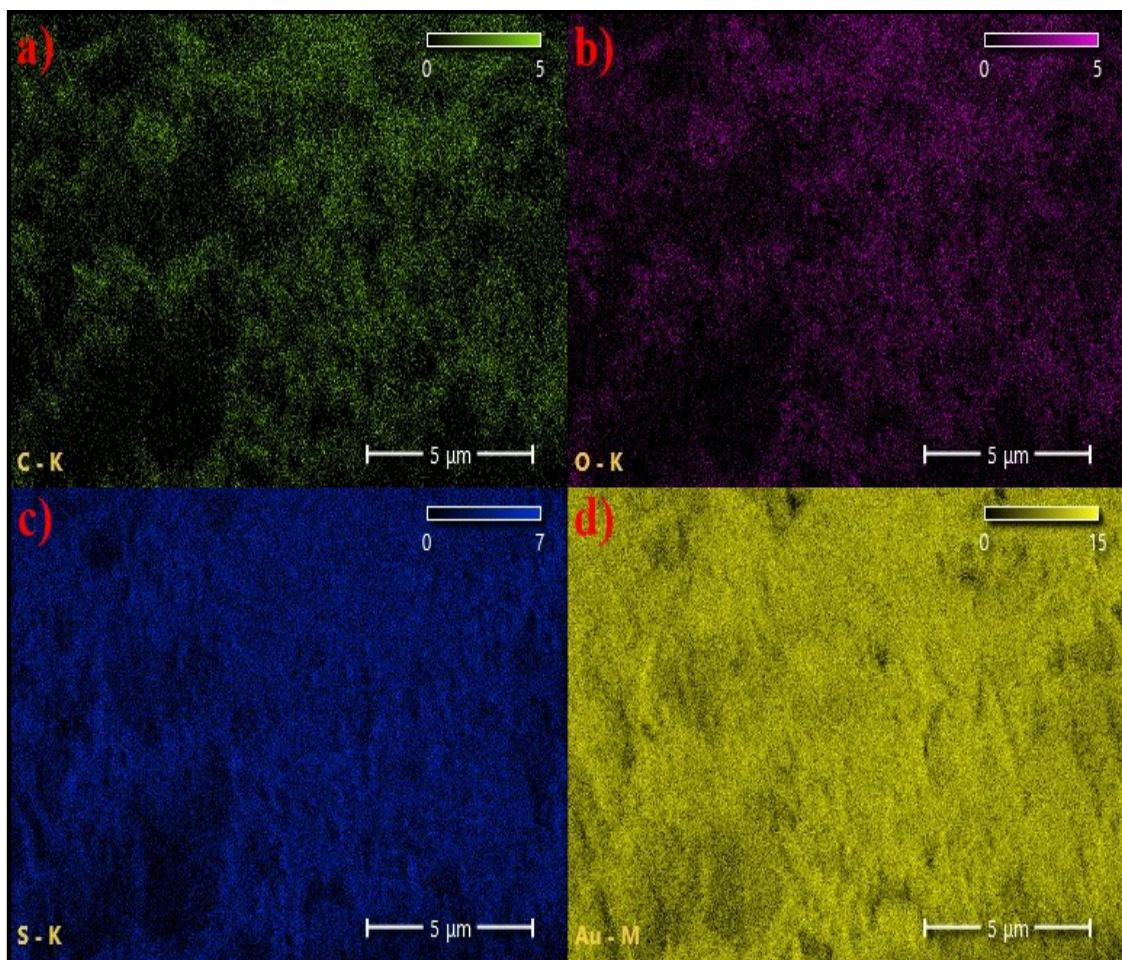


Fig. S5. EDS mapping analysis for **a)** C atom, **b)** O atom, **c)** S atom, and **d)** Au atom in the AuNPs/p(EDOT-co-3MT)/PGE.

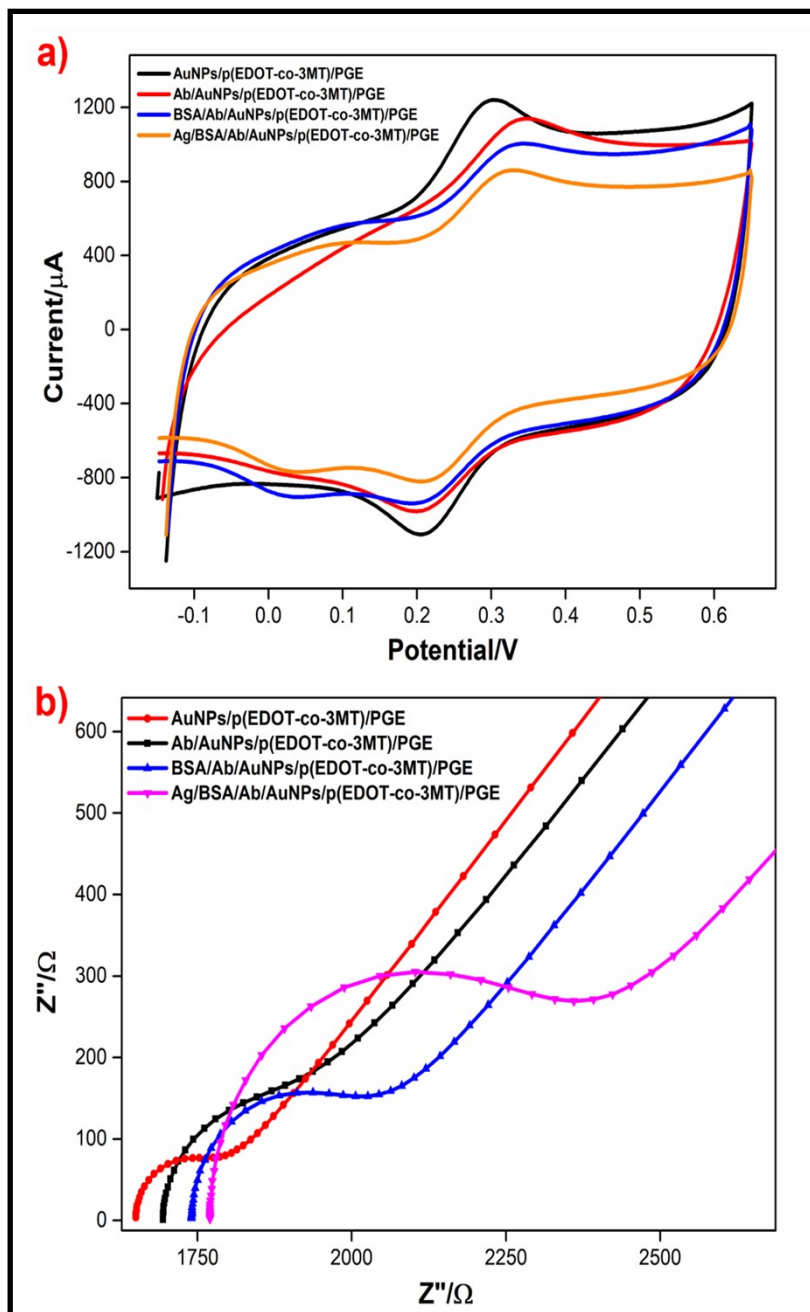


Fig. S6. Characterization of the AuNPs/p(EDOT-co-3MT)/PGE, Ab/AuNPs/p(EDOT-co-3MT)/PGE, BSA/Ab/AuNPs/p(EDOT-co-3MT)/PGE and Ag/BSA/Ab/AuNPs/p(EDOT-co-3MT)/PGE by **a)** CV and **b)** EIS.

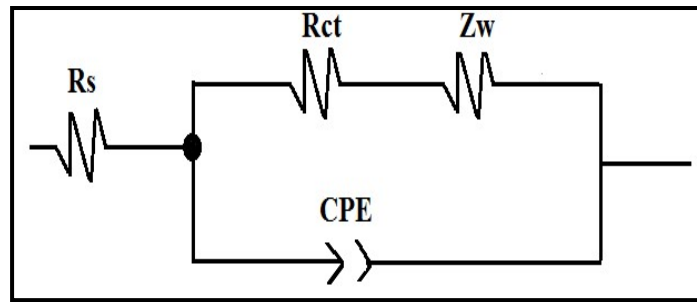


Fig. S7. Simple circuit model.

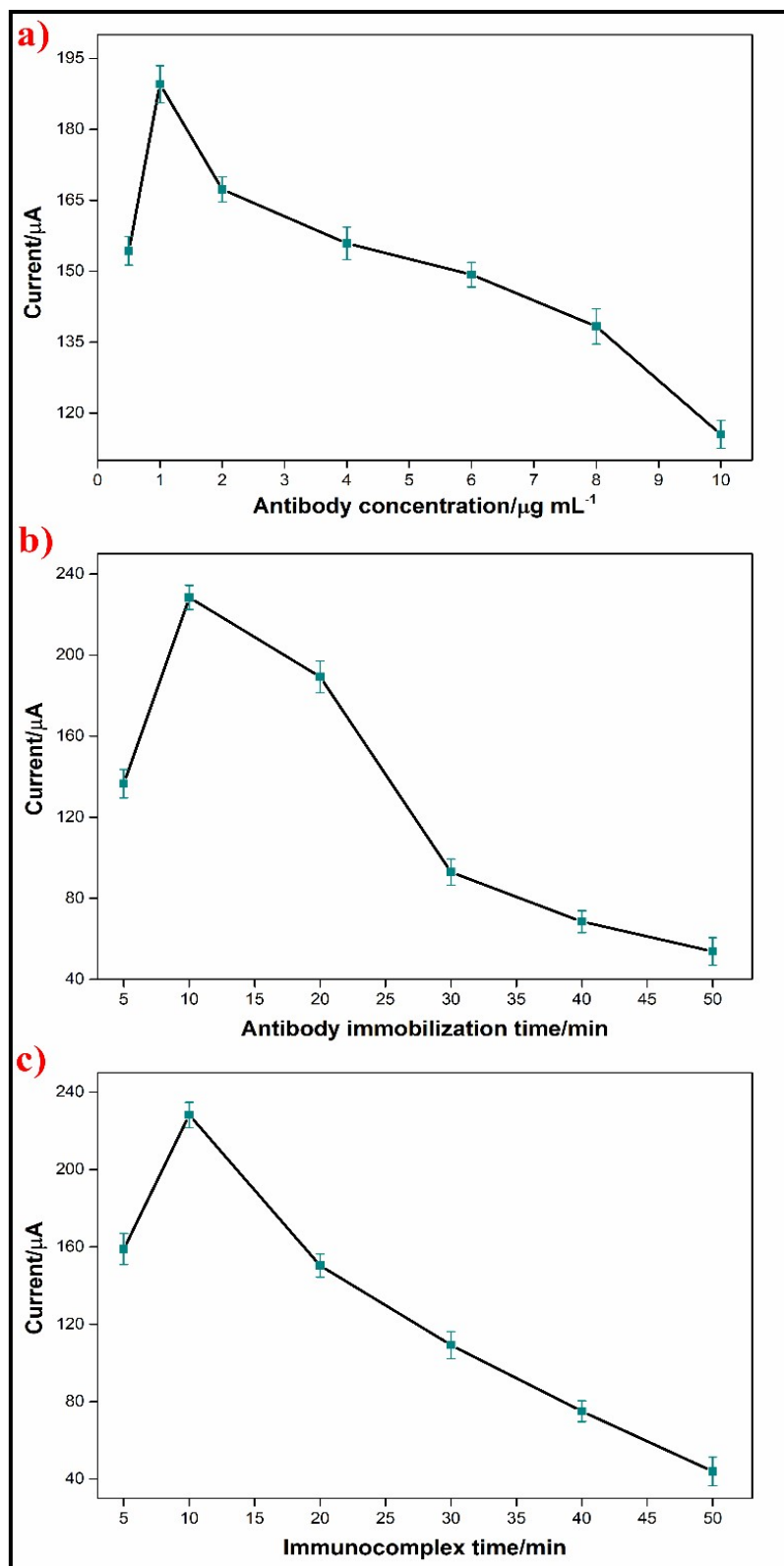


Fig. S8. Optimization of **a)** antibody concentration, **b)** antibody immobilization time, and **c)** immunocomplex formation time.

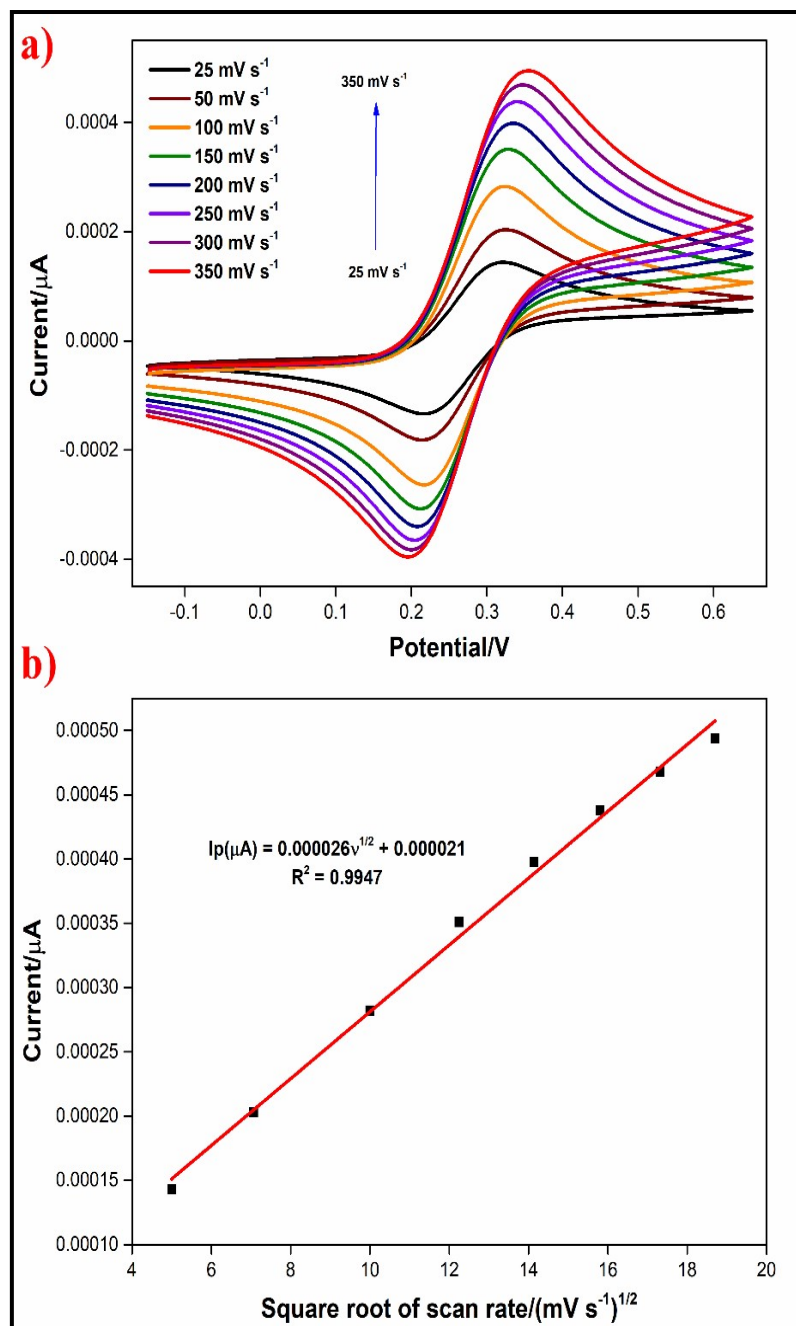


Fig. S9. a) Cyclic voltammograms of Bare/PGE in 5.0 mM $[\text{Fe}(\text{CN})_6]^{3-/4-}$ at different scan rates and b) Relationship between the square root of the scan rate and current.

Table S1. Atomic percentages of the Bare/PGE, p(EDOT-co-3MT)/PGE, and AuNPs/p(EDOT-co-3MT)/PGE.

Electrode	% C	% O	% Si	% S	% Au
Bare/PGE	96.0	2.7	3.3	0.0	0.0
p(EDOT-co-3MT)/PGE	50.7	34.0	0.0	15.3	0
AuNPs/ p(EDOT-co-3MT)/PGE	19.1	11.0	0.0	2.4	67.5