

Article

Enhancement of Dopamine Electrochemical Detection with Manganese Doped Crystalline Copper Oxide

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Table S1. Binding energies, line widths raw areas and normalized areas of the quantized core-level XPS lines.

Line name	BE (eV)	FWHM (eV)	Raw Area	Normalized area/(RSF*T*MFP)
Cu 2p 3/2 Cu ²⁺	933.78	2.584	114370	3886.15
Cu 2p 1/2 Cu ²⁺	953.78	3.024	57185	3827.52
Cu 2p 3/2 Cu ²⁺ surf	936.35	2.258	9963.58	339.177
Cu 2p 1/2 Cu ²⁺ sur	956.35	2.258	4981.79	334.101
sat1	942.33	1.965	-	-
sat2	944.49	3.041	-	-
sat 3	963.17	1.77	-	-
sat4	963.79	2.624	-	-
O 1s main	529.82	2.384	24181.9	3762.95
O 1s surf.	532.9	2.304	2281.9	355.443
Mn 2p 3/2	640.67	3.452	966.369	49.5943
Mn 2p 1/2	651.87	3.625	483.185	48.3589
Cu ²⁺ LMM (Auger)	KE 317.7 eV	-	-	-

RSF - relative sensitivity factor; T - transmission factor; MFP – mean free path.

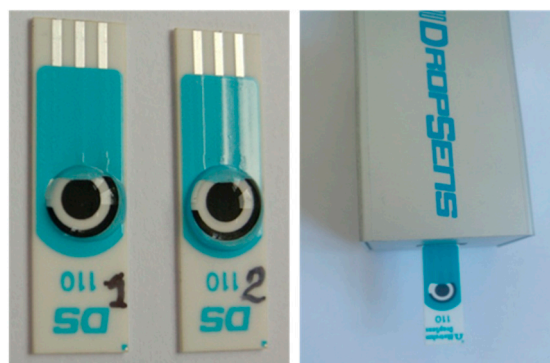


Figure S1. Optical images of SPE electrodes.

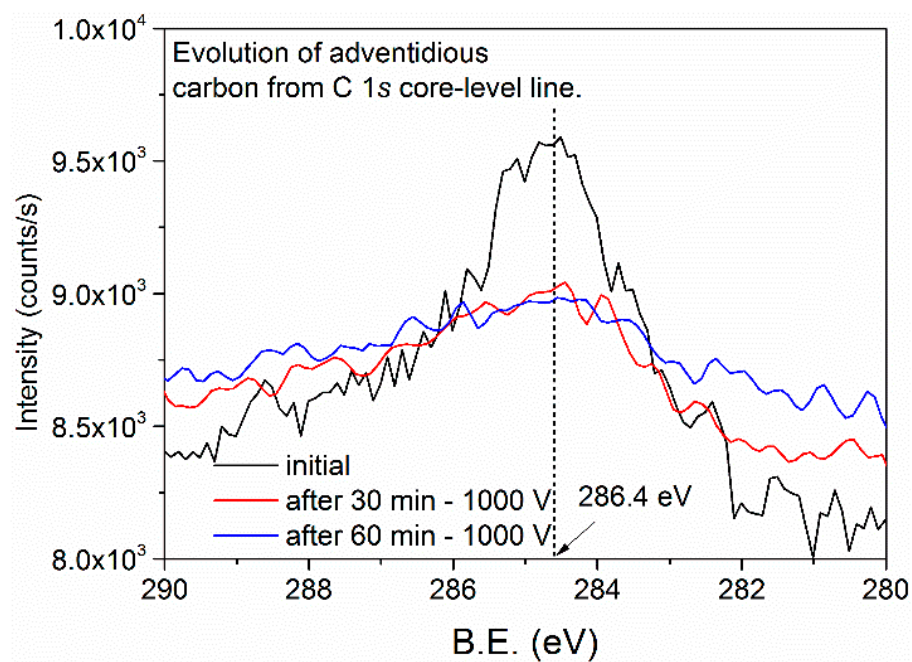


Figure S2. Evolution of the adventitious carbon after consecutive Ar ions etching of sample CuO:Mn.

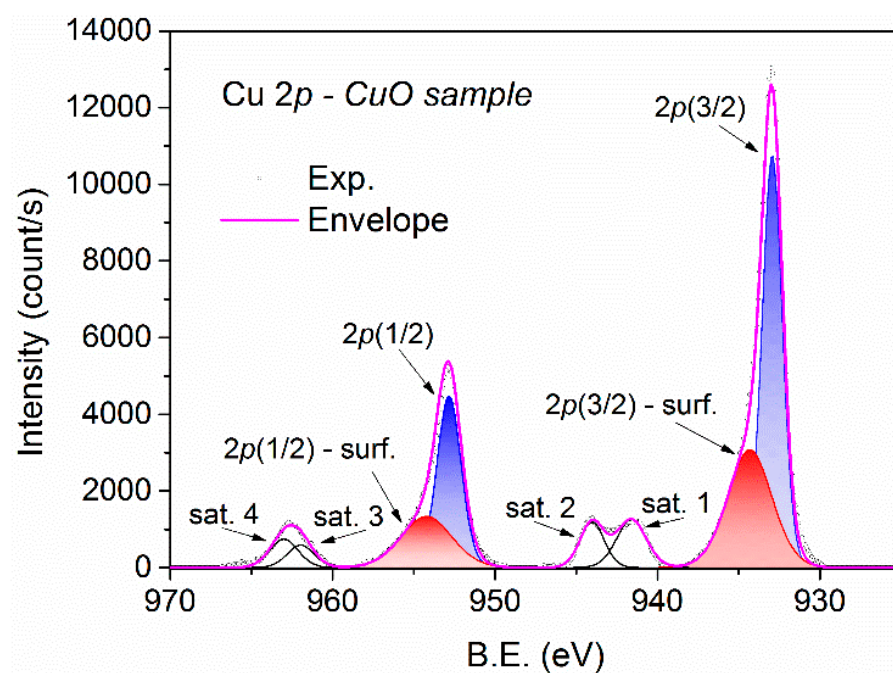


Figure S3. XPS recorded spectrum of Cu 2p core-level of CuO sample together with the corresponding deconvolutions and fitted curves.

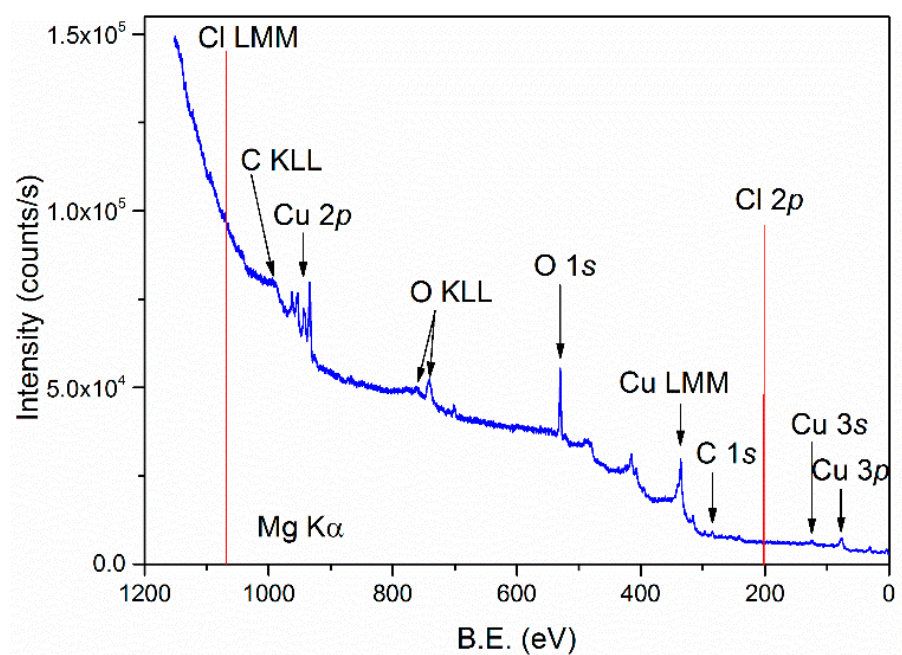
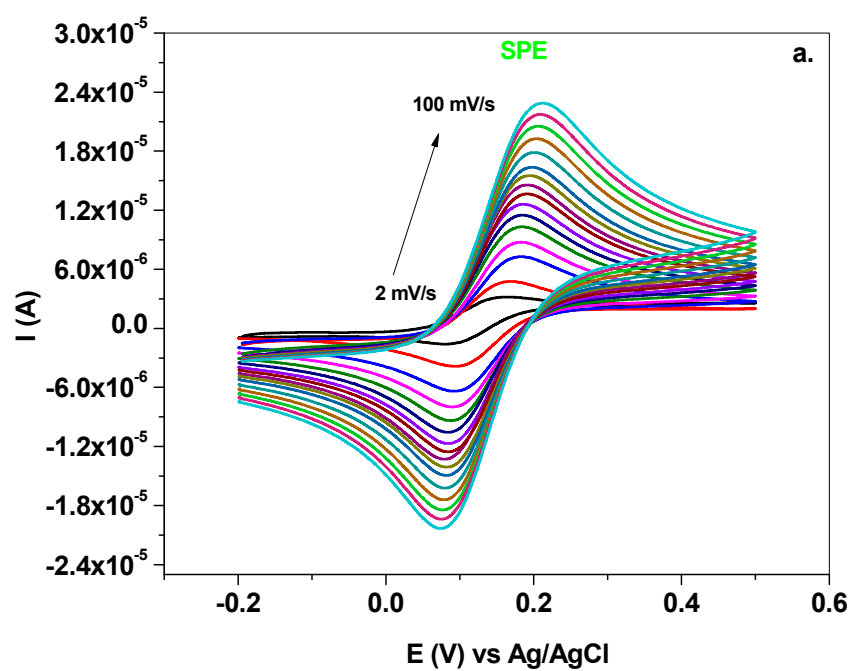


Figure S4. Survey spectrum of sample CuO. Red bars indicate the expected positions of the most intense Cl core-levels and Auger Cl LMM. These lines were not observed.



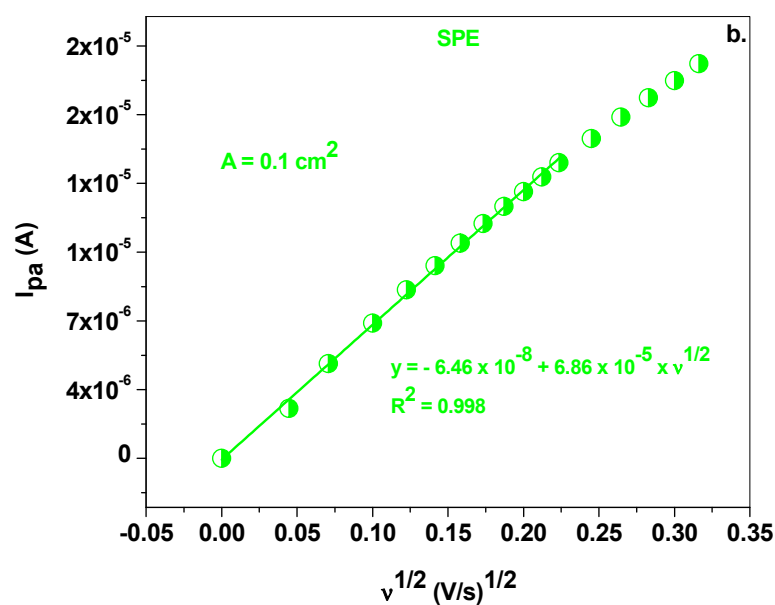
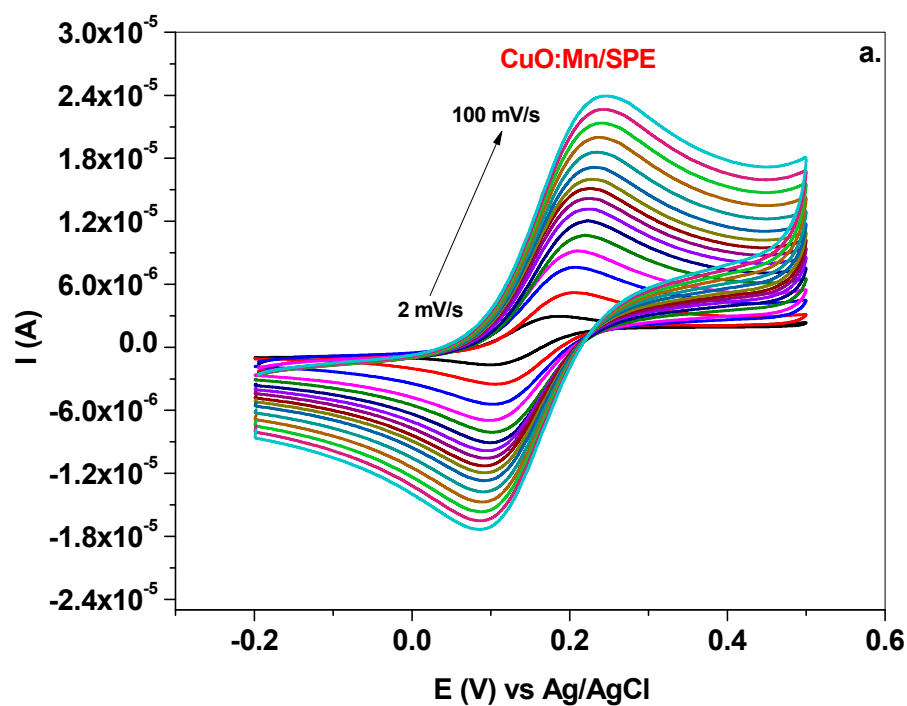


Figure S5. Cyclic voltammograms recorded with bare SPE with different scanning rates (2–100 mV/s) in solution containing 10^{-3} M potassium hexacyanoferrate (II) and 0.2 M KCl supporting electrolyte (a); the plot of I_{pa} versus the square root of scan rate, $v^{1/2}$ (b).



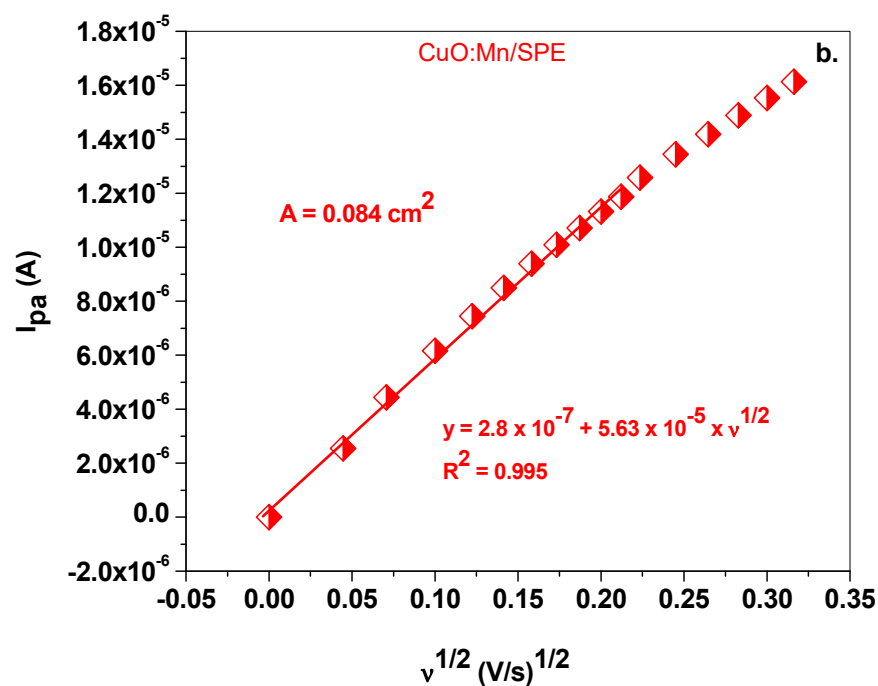


Figure S6. Cyclic voltammograms recorded with CuO:Mn/SPE with different scanning rates (2–100 mV/s) in solution containing 10^{-3} M potassium hexacyanoferrate (II) and 0.2 M KCl supporting electrolyte (a); the plot of I_{pa} versus the square root of scan rate, $v^{1/2}$ (b).

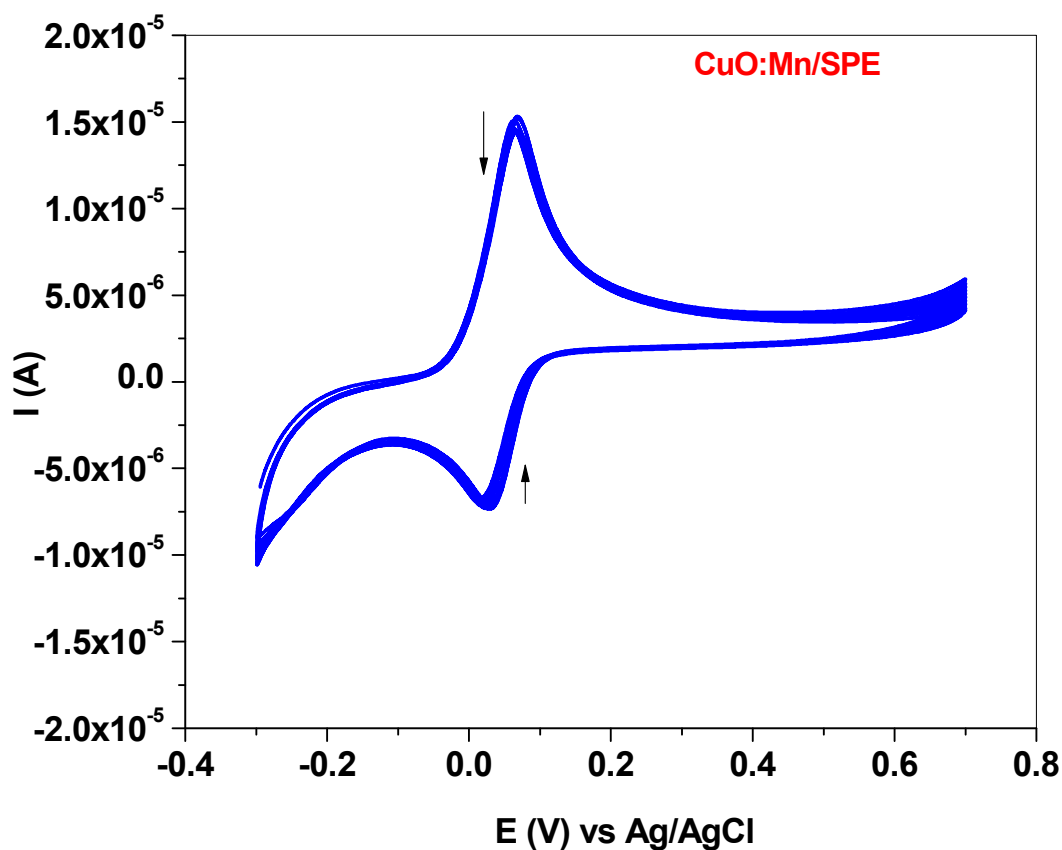


Figure S7. The stability of CuO:Mn/SPE, after successive scanning in solution containing 10^{-4} M dopamine (pH 5 acetate); 20 scans with 10 mV/s scan rate.

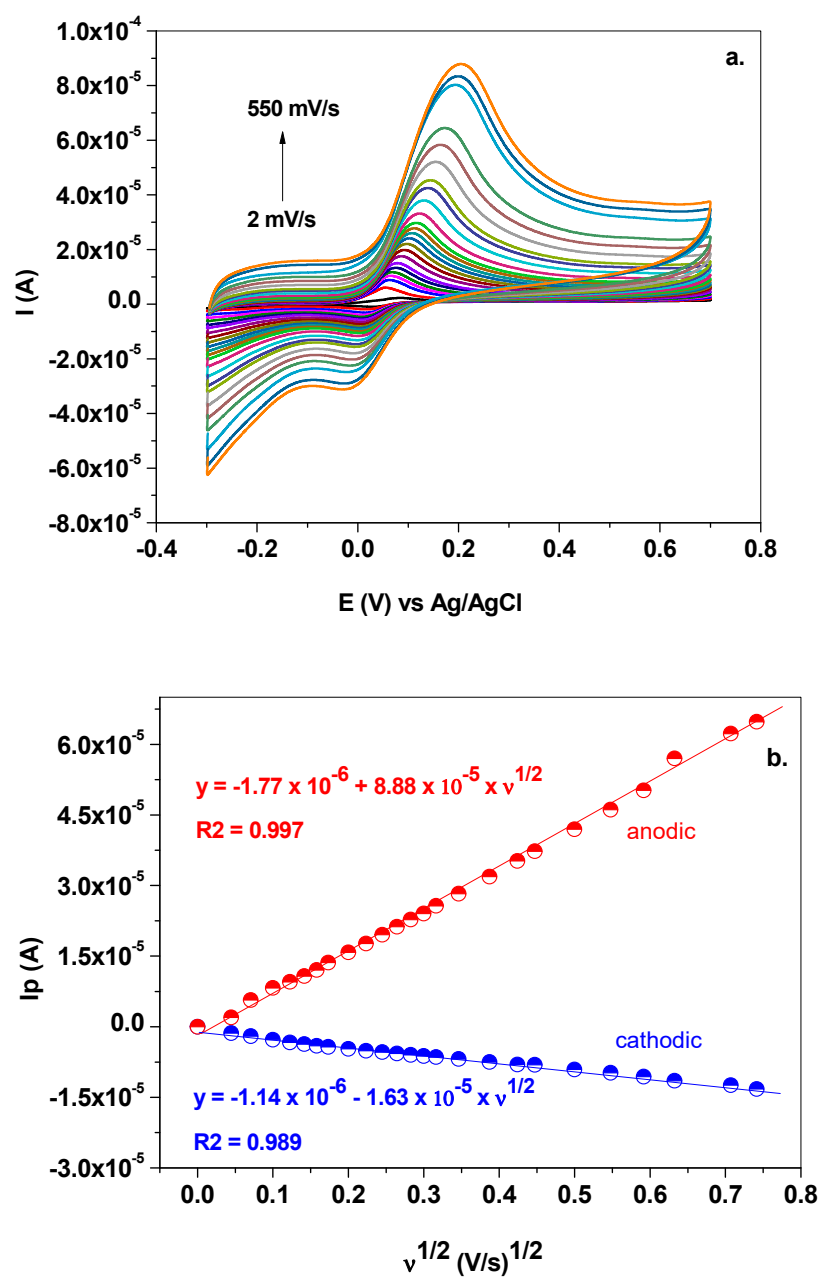


Figure S8. Cyclic voltammograms recorded with CuO:Mn/SPE in solution containing 10^{-4} M dopamine (pH 5.0 acetate buffer), with increasing scan rate: 2–550 mV/s (a); The variation of the current peaks (anodic and cathodic) with the square root of scan rate (b).

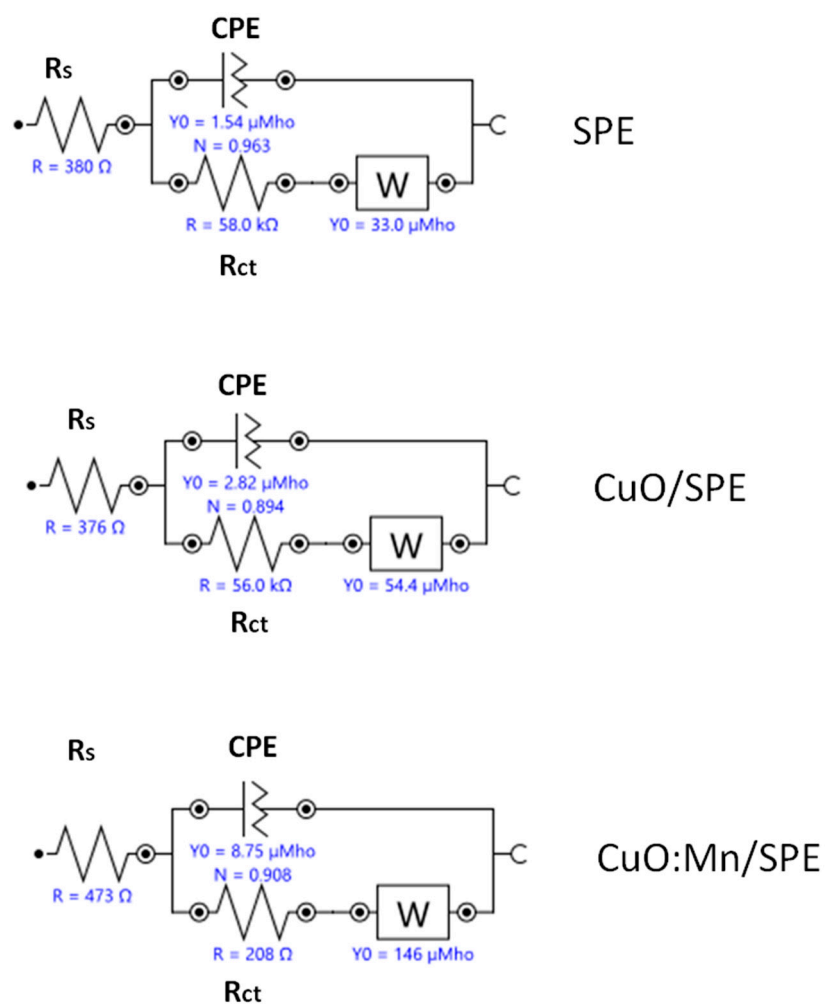


Figure S9. Equivalent electrical circuit employed to fit the EIS spectra of bare and modified SPE, CuO/SPE and CuO:Mn/SPE.

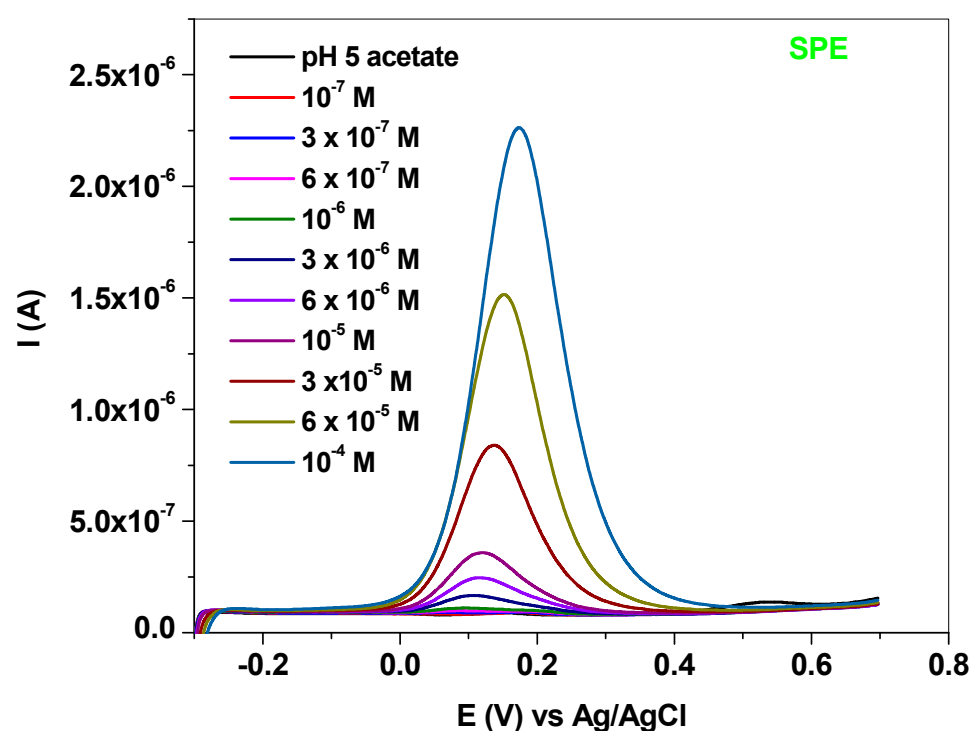


Figure S10. SW voltammograms recorded with bare SPE in solutions containing increasing concentrations of dopamine, 10^{-7} – 10^{-4} M range (pH 5.0 acetate buffer); 10 mV/s scan rate.

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