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Supplementary Information

for

Nanocomposite of Ellagic Acid with Multi-Walled Carbon Nanotubes for the Simultaneous Voltammetric Detection of Six Biomolecules

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Table S1. Analytical parameters for the simultaneous determination of AA, DA, UA, Trp, XN and CA using MGPE/MWCNTs-EA.

Analytes	Linear range (μM)	Calibration curve eqs.	R^2	LOD (nM)
AA	0.099-5.9	I_p=1.6249[AA]+ 2.8868	0.993	91
	5.9-54	I_p=0.2905[AA]+ 11.116	0.993	
DA	0.099-5.9	I_p =2.5049[DA]+ 3.0502	0.991	9.9
	5.9-54	I_p =0.2509[DA]+ 14.676	0.997	
UA	0.099-4.9	I_p =2.9013[UA]+ 4.2148	0.988	13
	4.9-54	I_p =0.4777[UA]+ 19.572	0.993	
Trp	0.099-5.9	I_p =2.1961[Trp]+ 4.6515	0.981	11
	5.9-54	I_p =0.2549[Trp]+ 14.286	0.997	
XN	0.099-7.9	I_p =3.0116[XN]+ 5.1323	0.988	14
	7.9-54	I_p =0.7350[XN]+ 22.263	0.993	
CA	0.099-5.9	I_p =3.0140[CF]+ 5.0675	0.990	78
	5.9-54	I_p =0.6289[CF]+ 20.598	0.982	

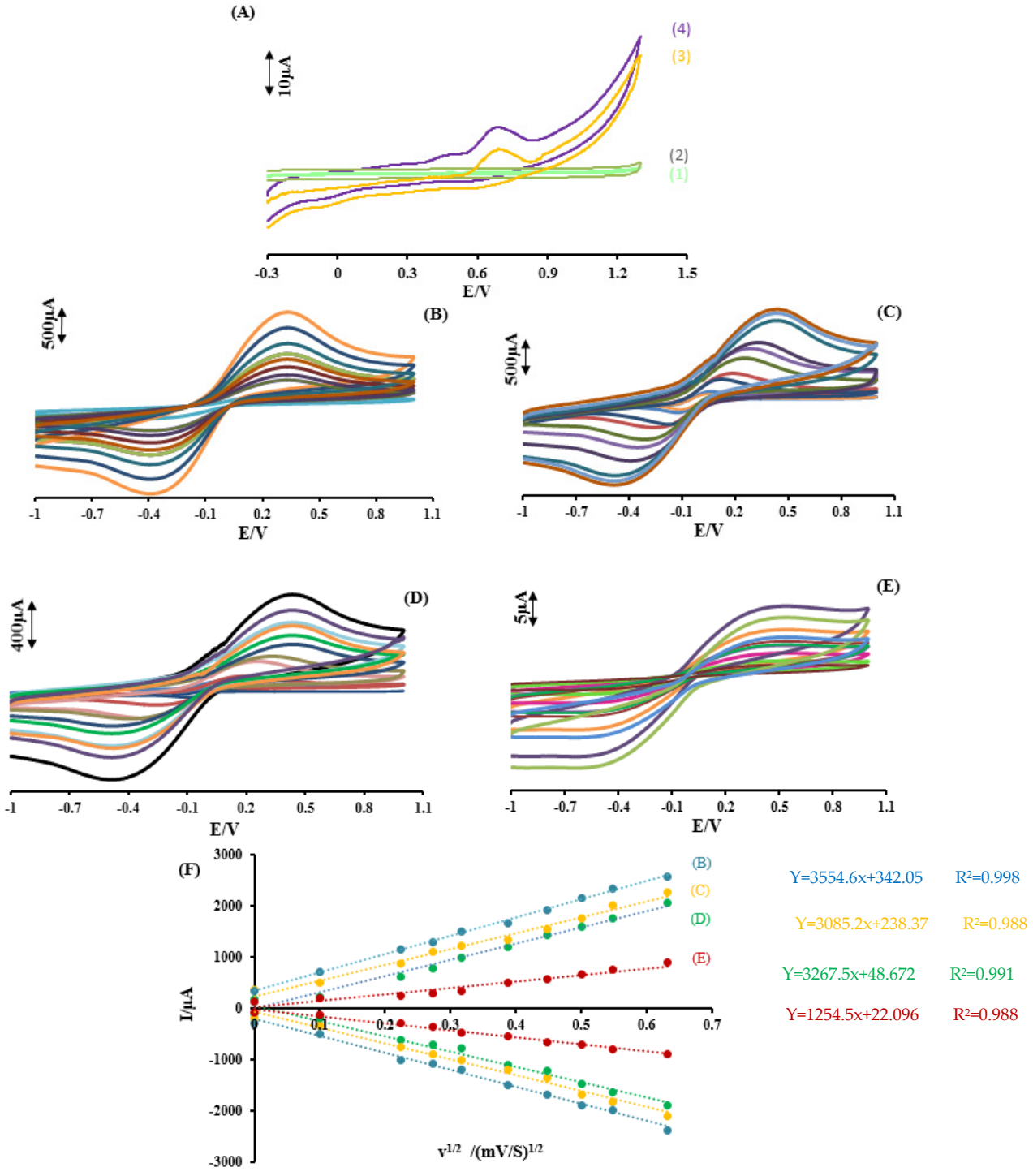

Figure S1. (**A**) Electrochemical studies of different electrodes in pH 2.0 PBS (1) GPE, (2) MGPE/MWCNTs, (3) MGPE/EA, and (4) MGPE/MWCNTs-EA. (**B**) MGPE/MWCNTs-EA, (**C**) MGPE/MWCNTs, (**D**) MGPE/EA and (**E**) GPE in 1 mM $[Fe(CN)_6]^{3-}$ prepared in 0.1 M KCl with different scan rate (**F**) the plot of peak current *vs.* the square root of scan rate for MGPE/MWCNTs-EA , MGPE/MWCNTs, MGPE/EA and GPE.

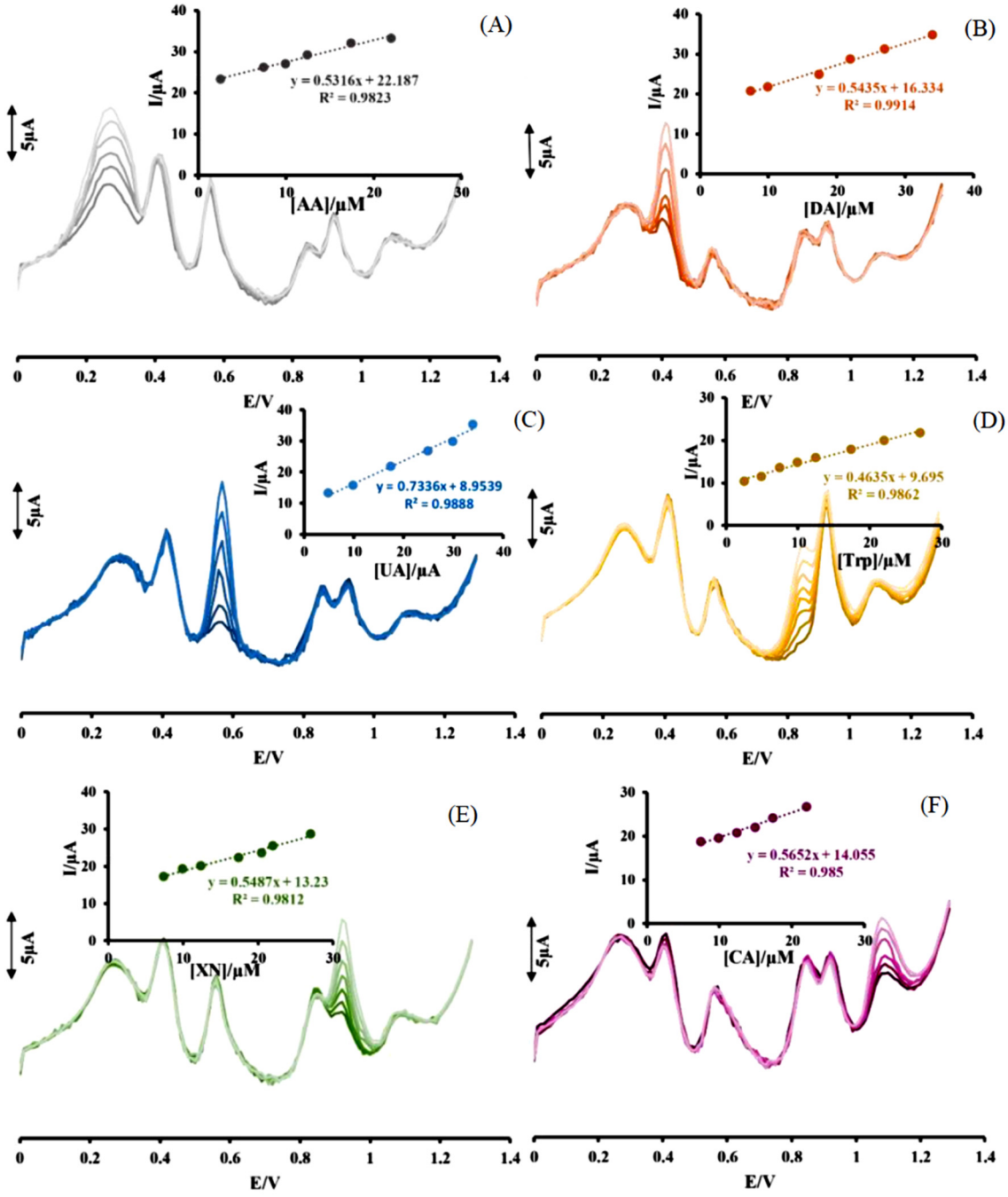

Figure S2. Differential pulse voltammograms at MGPE/MWCNTs-EA in 0.1 M PBS (pH 2.0) (**A**) containing DA (14.9 µM), UA (9.9 µM),TrP, XN and CA (4.9 µM) and different concentrations of AA (from inner to outer): (2.5, 7.4, 9.9, 12.4, 17.4 and 22.0 µM), (**B**) containing AA (2.5 µM), UA, Trp, XN and CA (4.9 µM each) and different concentrations of DA (from inner to outer): (7.4, 9.9, 17.4, 22.0, 27.0 and 34 µM), (**C**) containing AA (2.5 µM), DA (14.9 µM), Trp, XN, CA (4.9 µM each) and different concentrations of UA (from inner to outer): (4.9, 9.9, 17.4, 24.9, 29.9 and 34.0 µM), (**D**) containing AA (2.5 µM), DA (14.9 µM), UA, CA (4.9 µM each) XN (9.9 µM) and different concentrations of Trp (from inner to outer): (2.5, 4.9, 7.4, 9.9, 12.4, 17.4, 22.0 and 27.0 µM), (**E**) containing AA (2.5 µM), DA (14.9 µM), UA, CA (4.9 µM each), Trp (9.9 µM), and different concentrations of XN (from inner to outer): (7.4, 9.9, 12.4, 17.4, 20.5, 22.0 and 27.0 µM) and (**F**) containing AA (2.5 µM), DA, Trp (9.9 µM) UA, XN (4.9 µM each) and different concentrations of CA (from inner to outer): (7.4, 9.9, 12.4, 14.9, 17.4 and 22.0 µM).

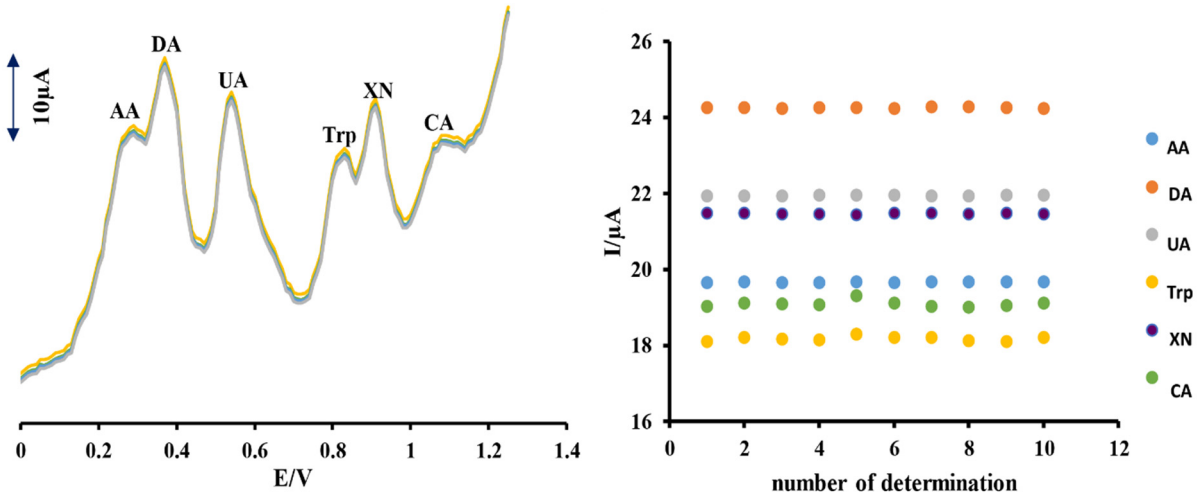

Figure S3. The stability of repeatative measurments of DPV using MGPE/MWCNTs-EA in 0.1 M PBS (pH 2.0) containing 14.9 μM AA, 22.0 μM DA, 14.9 μM UA, 14.9 μM Trp, 14.9 μM XN and 22.0 μM CA with the plot of ΔI vs. number of consecutive measurements.

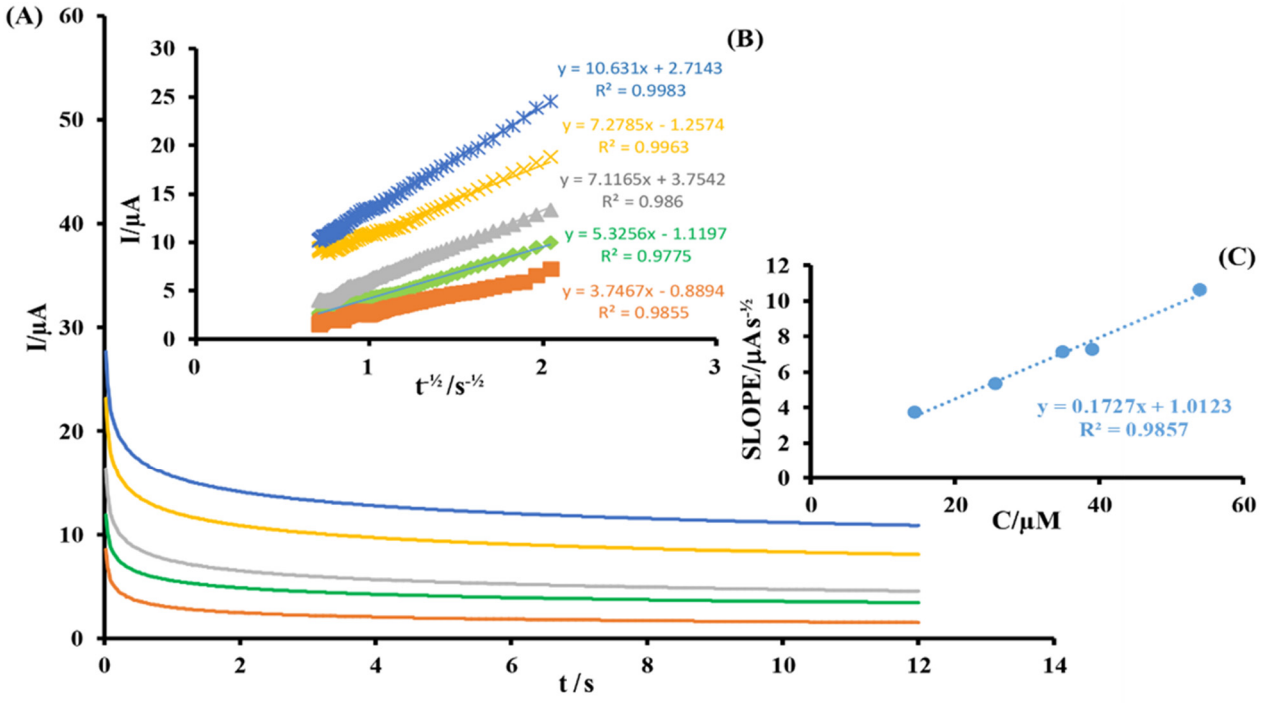

Figure S4. (**A**) Typical chronoamperograms obtained at MGPE/MWCNTs-EA in 0.1 M PBS (pH 2.0) for different concentrations of DA at 14.4 μM (orange), 25.6 μM (green), 35.0 μM (gray), 39.0 μM (yellow) and 54.0 μM (blue); (**B**) Plots of I vs. $t^{-1/2}$ obtained from chronoamperograms; (**C**) Plot of the slope of the linear dynamic range against DA concentration.

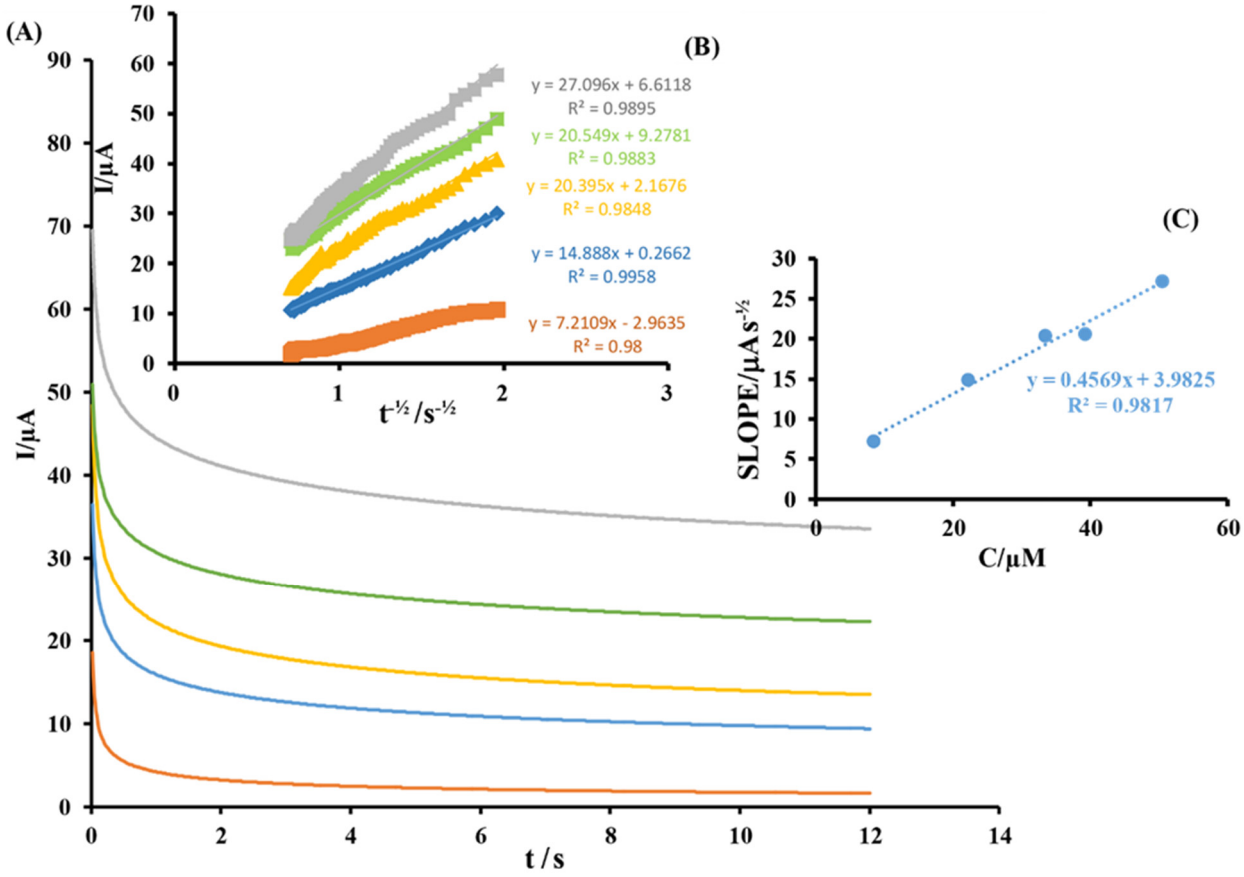

Figure S5. (**A**) Typical chronoamperograms obtained at MGPE/MWCNTs-EA in 0.1 M PBS (pH 2.0) for different concentration of UA at 8.4 µM (orange), 22.2 µM (blue), 33.4 µM (yellow), 39.2 µM (green) and 50.45 µM (gray); (**B**) Plots of I vs. $t^{-1/2}$ obtained from chronoamperograms; (**C**) Plot of the slope of the linear dynamic range against UA concentration.

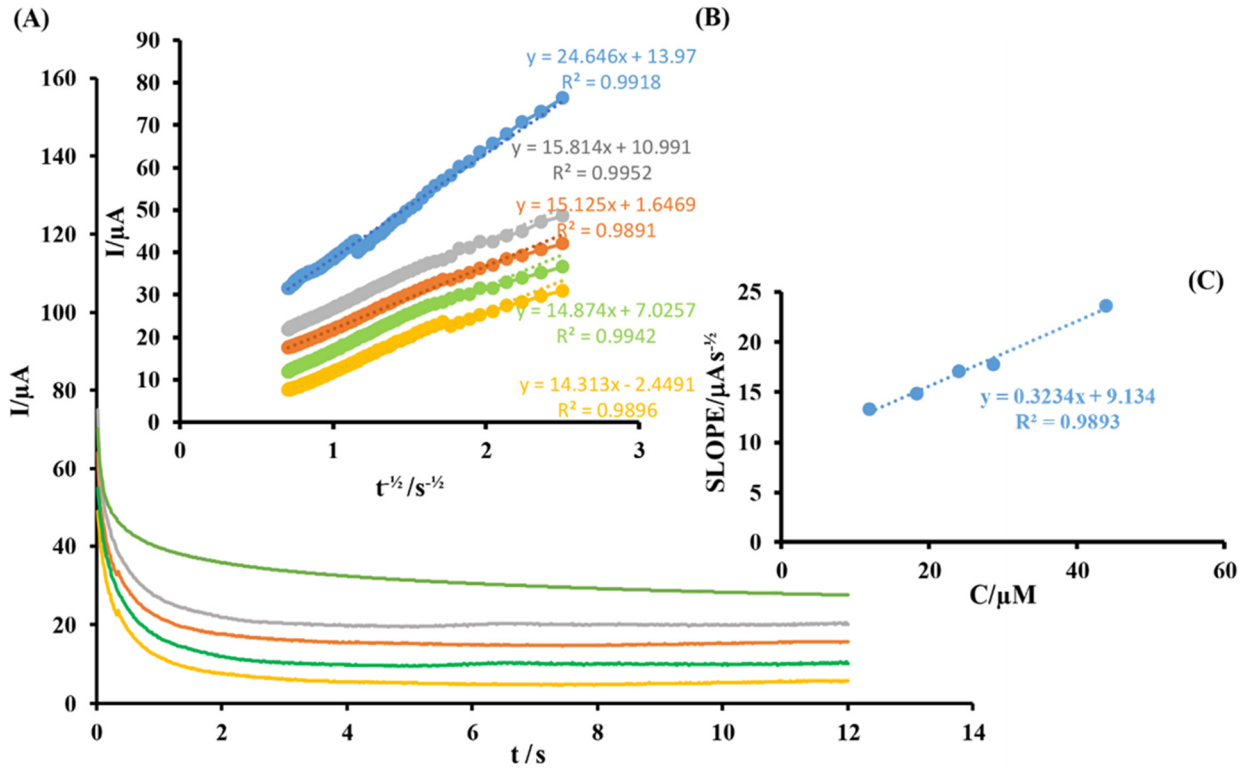

Figure S6. (**A**) Typical chronoamperograms obtained at MGPE/MWCNTs-EA in 0.1 M PBS (pH 2.0) for different concentration of Trp at 11.9 µM (orange), 18.4 µM (green), 24.0 µM (red), 28.7 µM (gray) and 43.9 µM (blue); (**B**) Plots of I vs. $t^{-1/2}$ obtained from chronoamperograms; (**C**) Plot of the slope of the linear dynamic range against Trp concentration.

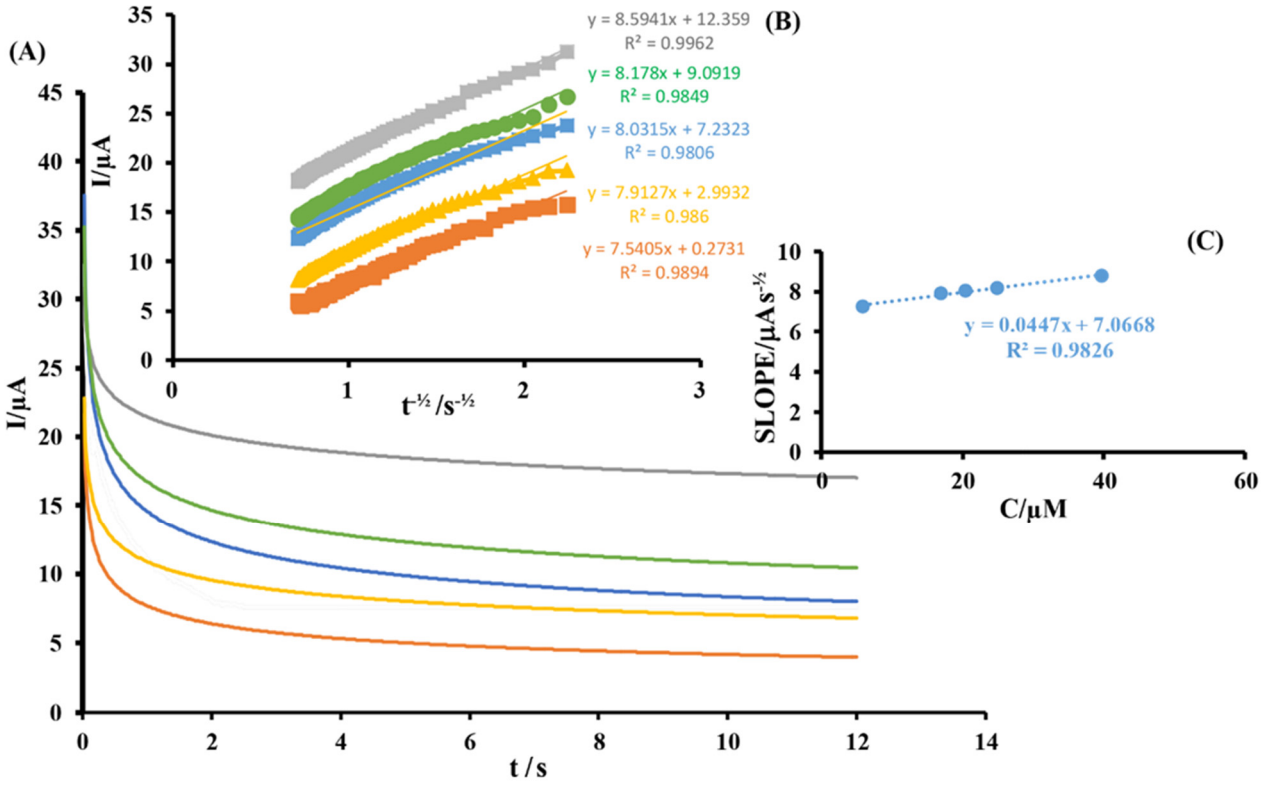

Figure S7. (**A**) Typical chronoamperograms obtained at MGPE/MWCNTs-EA in 0.1 M PBS (pH 2.0) for different concentration of XN at 5.9 µM (orange), 16.9 µM (yellow), 20.4 µM (blue), 24.8 µM (green) and 39.7 µM (gray); (**B**) Plots of I vs. $t^{-1/2}$ obtained from chronoamperograms; (**C**) Plot of the slope of the linear dynamic range against XN concentration.

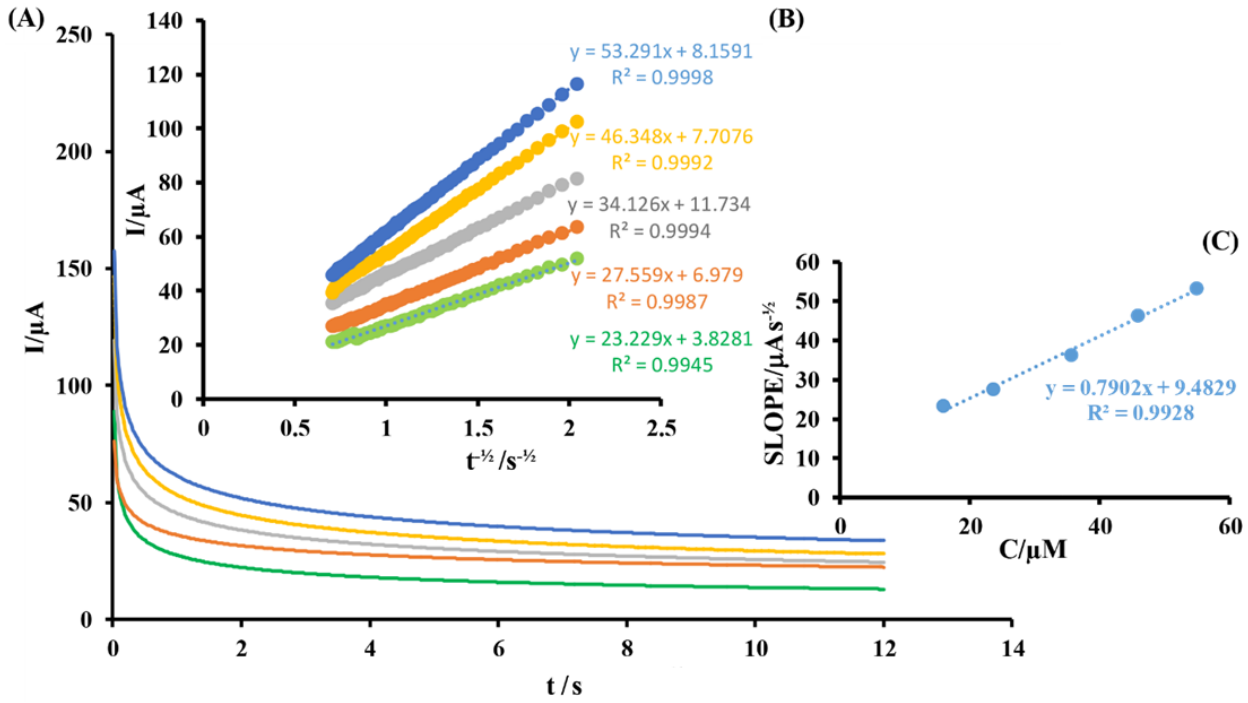

Figure S8. (**A**) Typical chronoamperograms obtained at MGPE/MWCNTs-EA in 0.1 M PBS (pH 2.0) for different concentrations of CA at 15.9 µM (green), 23.6 µM (orange), 35.6 µM (gray), 45.8 µM (yellow) and 54.9 µM (blue); (**B**) Plots of I vs. $t^{-1/2}$ obtained from chronoamperograms; (**C**) Plot of the slope of the linear dynamic range against CA concentration.