

Supplementary Information

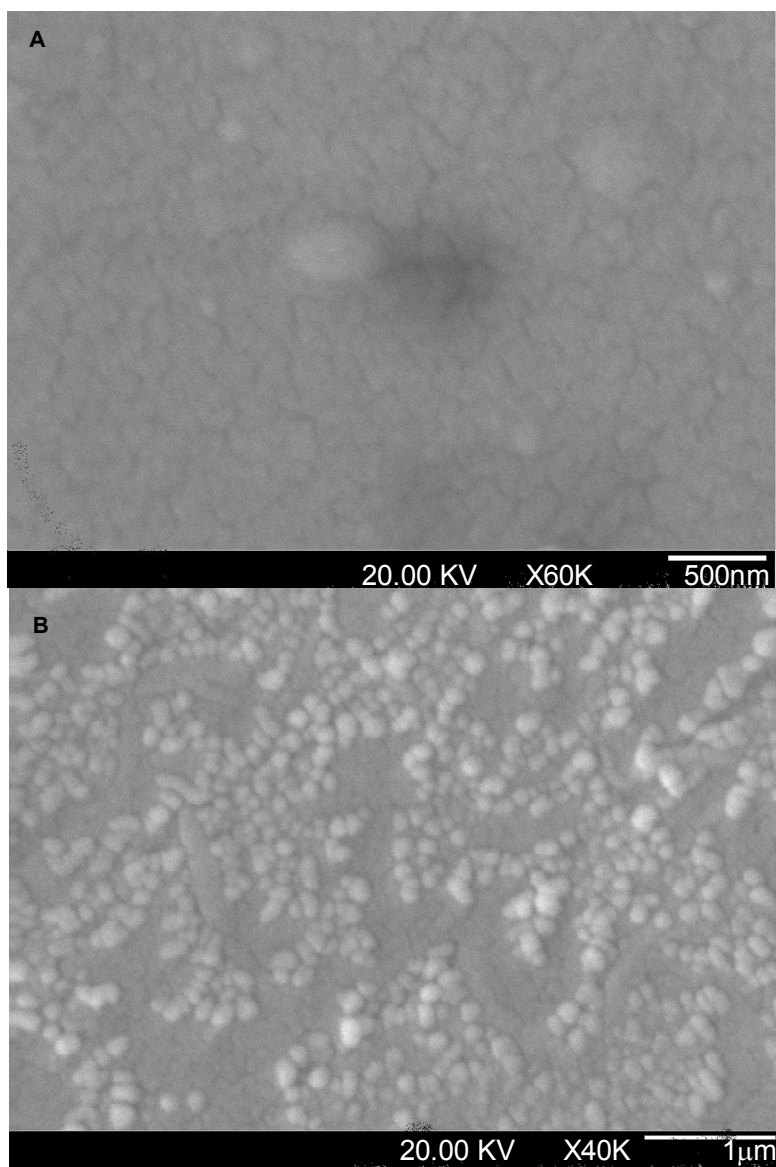
A comparative study of the electrochemical characteristics and simultaneous determination of dopamine, acetaminophen, and aspirin at a ruthenium oxide nanoparticles modified glassy carbon electrode versus a bare one

Fatemeh Chatraei and Hamid R. Zare*

Department of Chemistry, Yazd University, Yazd, 89195-741, Iran

Fax number: +98 351 8210991 Telephone number: +98 351 8122669

E-mail address: hrzare@yazduni.ac.ir



Scheme S1. Scanning electron microscopy of (A) bare GCE and (B) RuON-GCE.

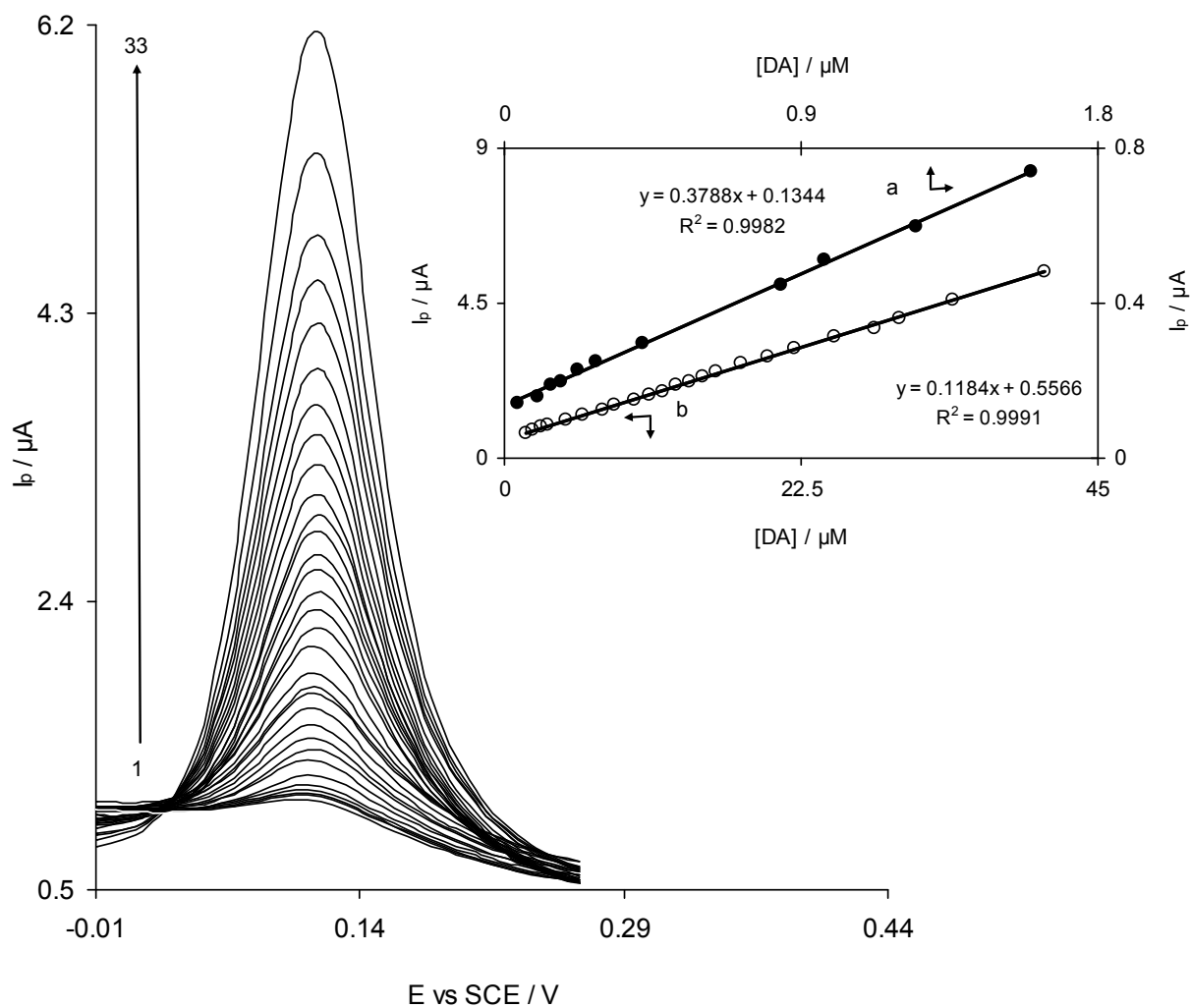


Fig. S1. Differential pulse voltammograms of RuON-GCE in a 0.1 M phosphate buffer solution (pH 7.0) containing different concentrations of DA. Numbers 1-33 correspond to 4.0×10^{-2} -41.0 μM of DA. Inset shows the plot of the electrocatalytic peak current, corrected for any residual current, as a function of DA concentration in the two linear ranges of (a) 4.0×10^{-2} -1.6 μM and (b) 1.6-41.0 μM of DA.

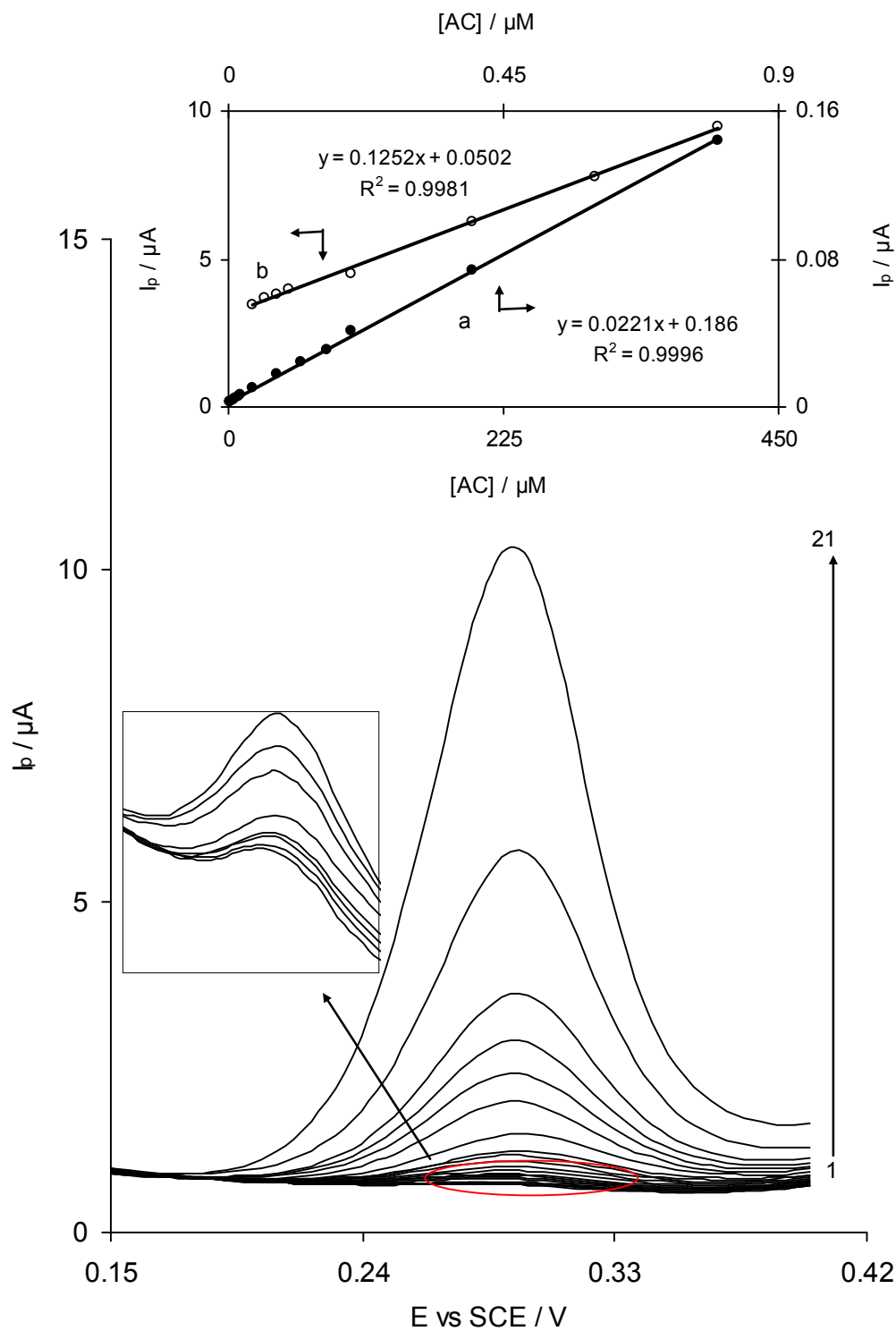


Fig. S2. Differential pulse voltammograms of RuON-GCE in a 0.1 M phosphate buffer solution (pH 7.0) containing different concentrations of AC. Numbers 1-21 correspond to 4.0×10^{-2} -400.0 μM of AC. Inset shows the plot of the electrocatalytic peak current, corrected for any residual current, as a function of AC concentration in the two linear ranges of (a) 4.0×10^{-2} -0.8 μM and (b) 0.8-400.0 μM of AC.

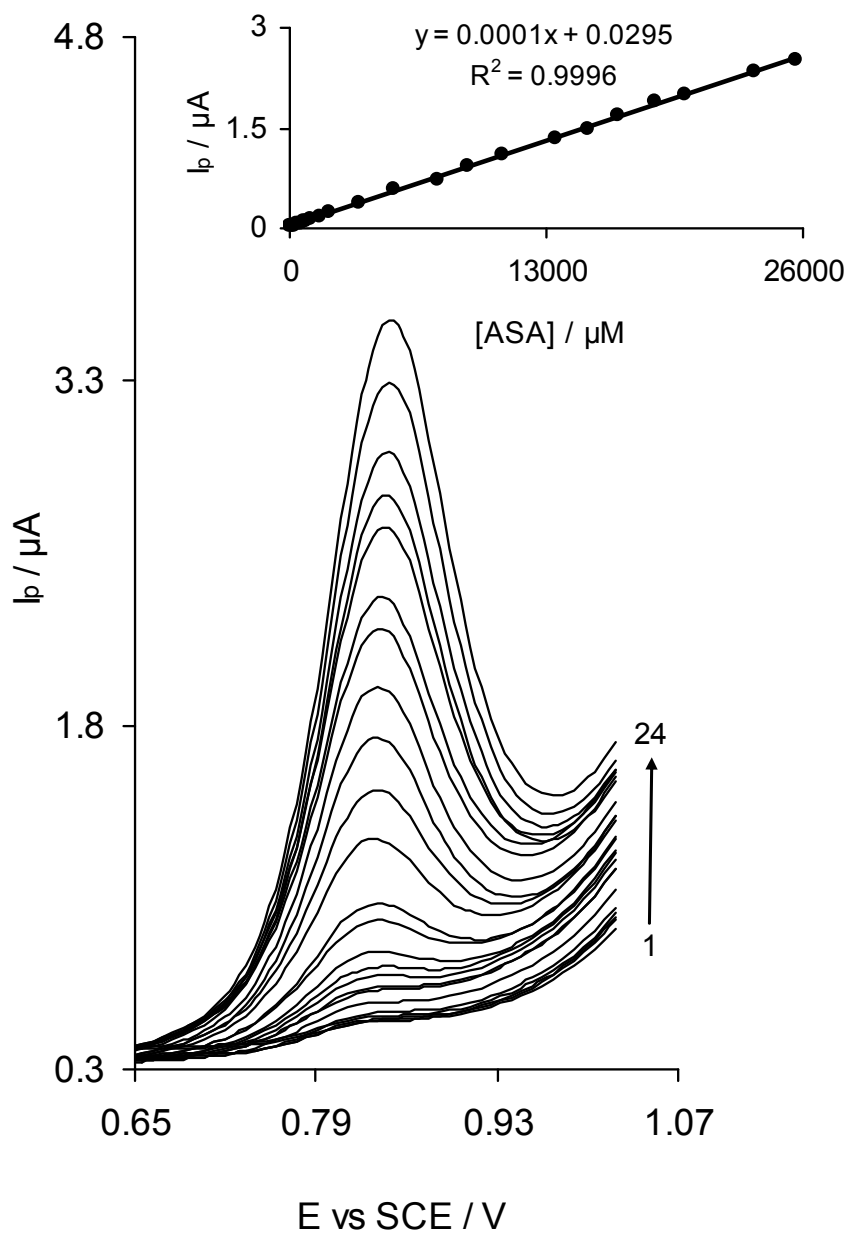


Fig. S3. Differential pulse voltammograms of RuON-GCE in a 0.1 M phosphate buffer solution (pH 7.0) containing different concentrations of ASA. Numbers 1-24 correspond to 40.0-25600.0 μM of ASA. Inset shows the plot of the electrocatalytic peak current, corrected for any residual current, as a function of ASA concentration in the linear range of 40.0-25600.0 μM of ASA.

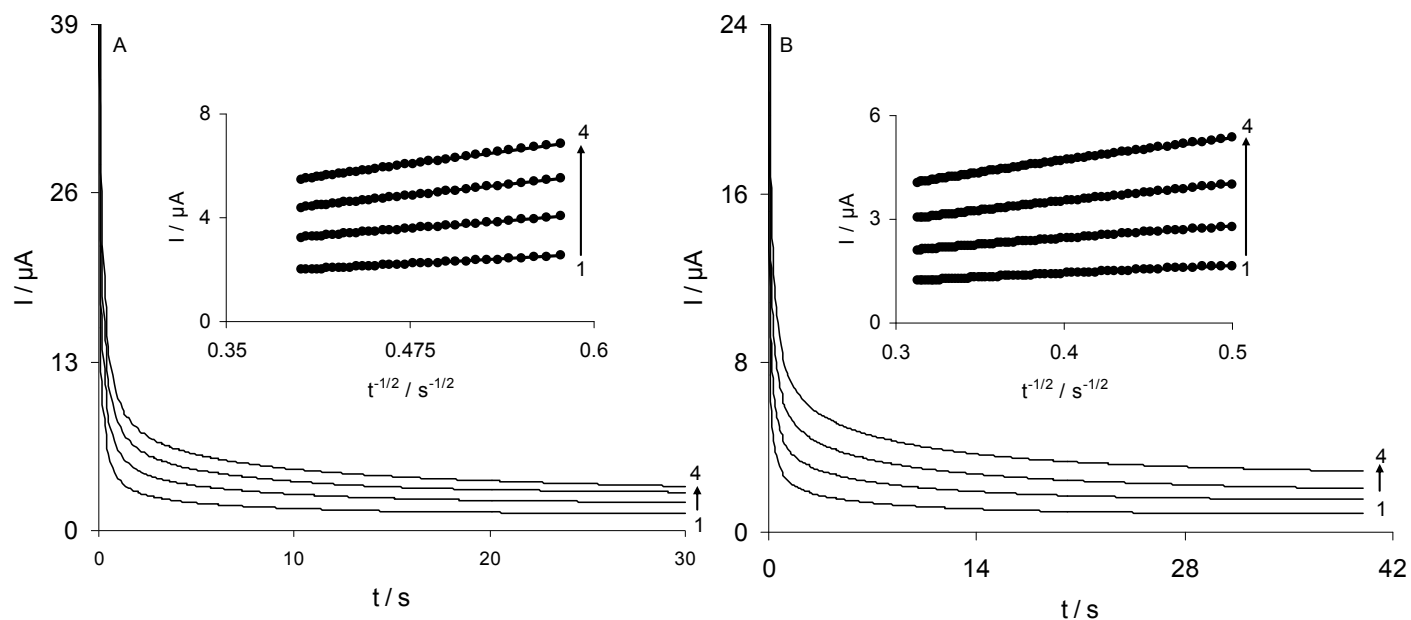


Fig. S4. Chronoamperograms of a 0.1 M phosphate buffer solution (pH 7.0) containing different concentration of DA at (A) potential step of 220 mV at RuON-GCE and (B) potential step of 600 mV at BGCE. Insets show plots of I vs. $t^{-1/2}$ obtained from the data of chronoamperograms. Numbers of 1-4 correspond to 0.2, 0.4, 0.6 and 0.8 mM of DA respectively.

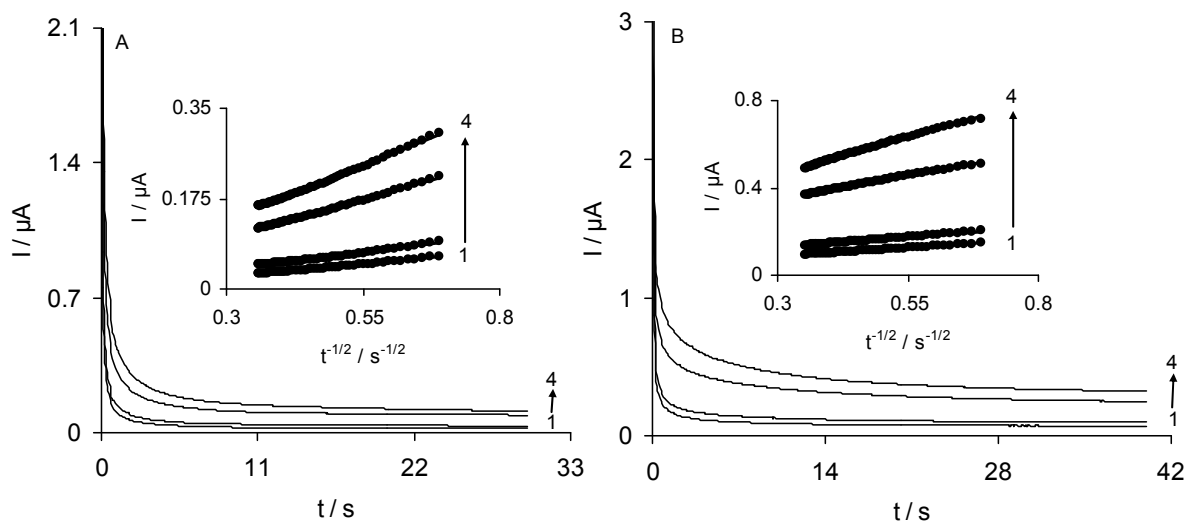


Fig. S5. Chronoamperograms of a 0.1 M phosphate buffer solution (pH 7.0) containing different concentration of AC at (A) potential step of 380 mV at RuON-GCE and (B) potential step of 460 mV at BGCE. Insets show plots of I vs. $t^{-1/2}$ obtained from the data of chronoamperograms. Numbers of 1-4 correspond to 0.01, 0.02, 0.08 and 0.1 mM of AC respectively.

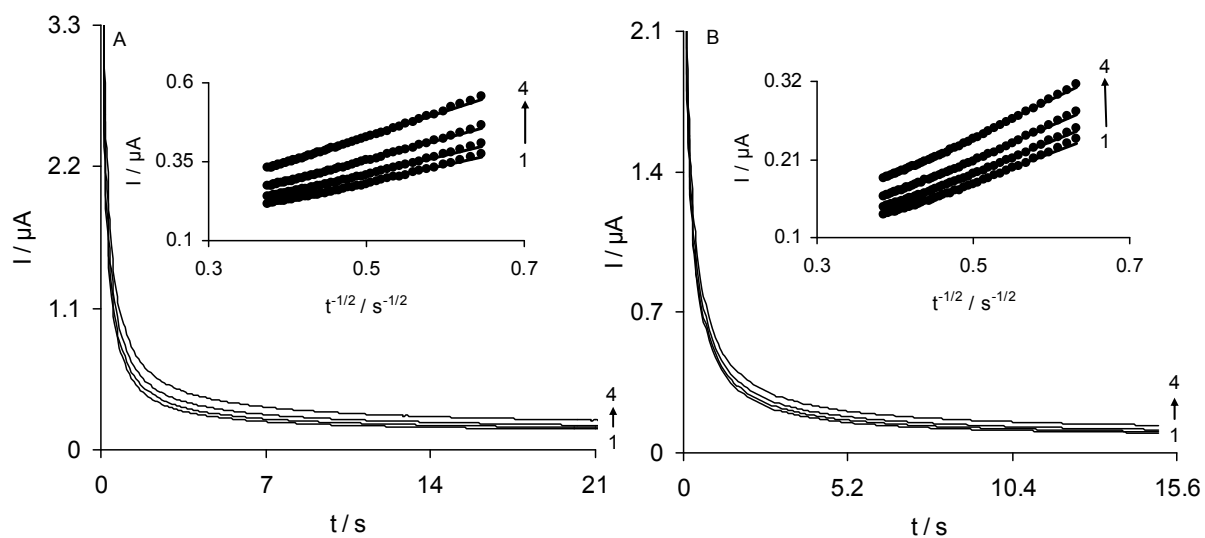


Fig. S6. Chronoamperograms of a 0.1 M phosphate buffer solution (pH 7.0) containing different concentration of ASA at (A) potential step of 800 mV at RuON-GCE and (B) potential step of 1000 mV at BGCE. Insets show plots of I vs. $t^{-1/2}$ obtained from the data of chronoamperograms. Numbers of 1-4 correspond to 0.06, 0.08, 0.1 and 0.2 mM of ASA respectively.

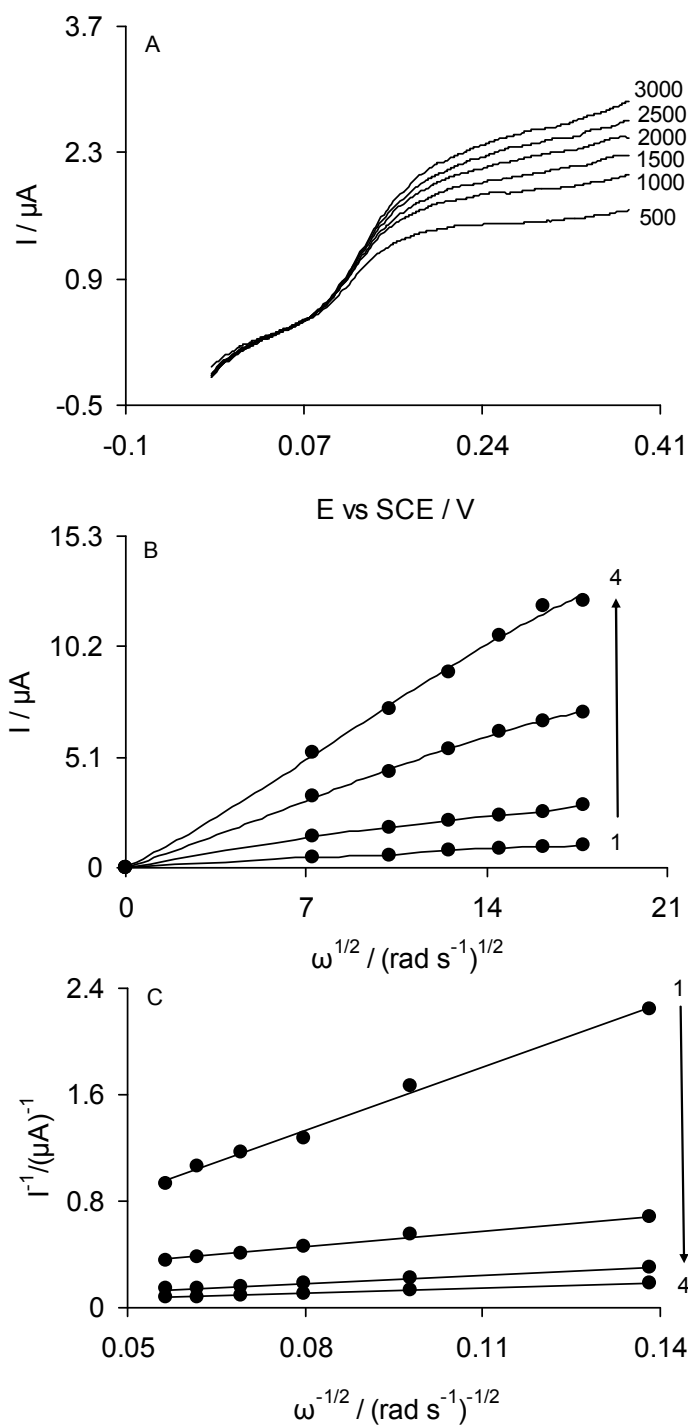


Fig. S7. (A) Typical steady-state voltammograms obtained for a RuON-GCE in a 0.1 M phosphate buffer solution (pH 7.0) containing 0.05 mM DA at the various rotation rates indicated for each voltammograms. (B) Levich plots which drawn with using currents corresponding to $E_{disk} = 200$ mV and different concentrations of DA. Numbers of 1–4 correspond to 0.05, 0.1, 0.2 and 0.3 mM of DA. (C) Koutecky–Levich plots obtained from Levich plots shown in (B).

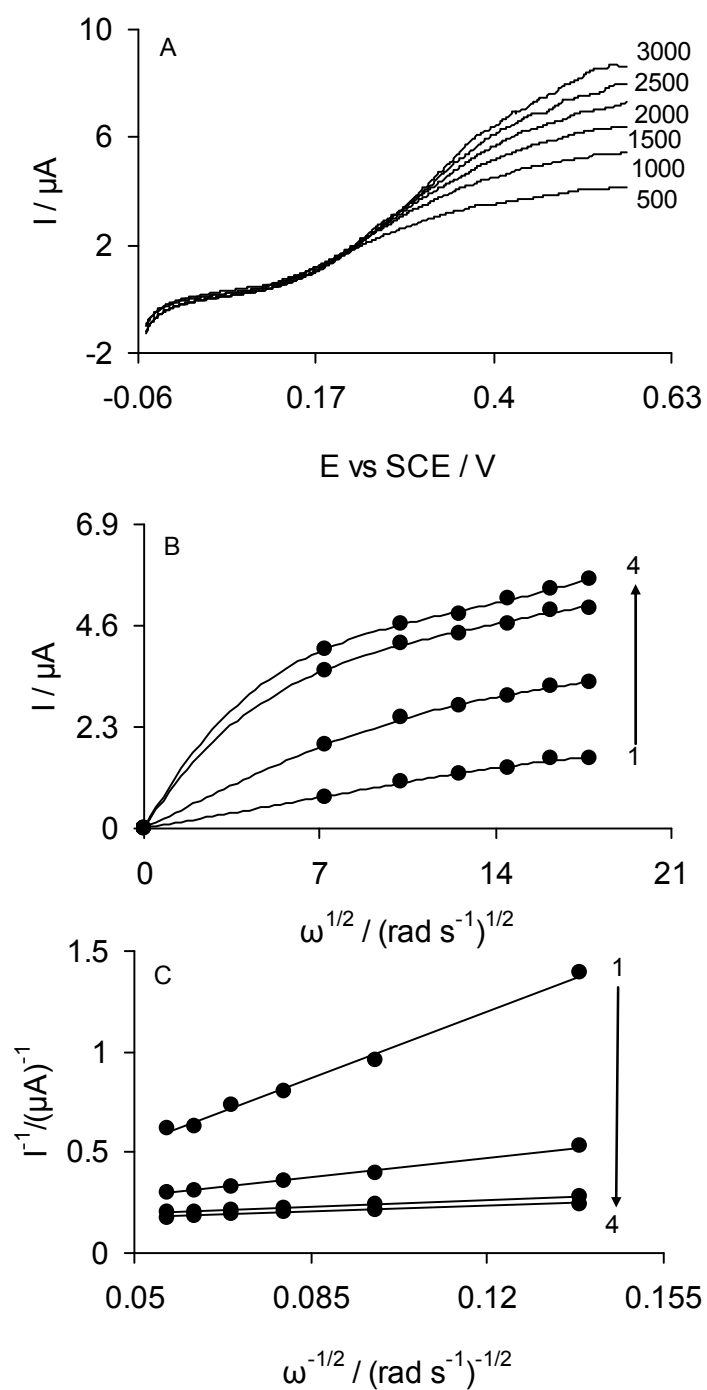


Fig. S8. (A) Typical steady-state voltammograms obtained for a BGCE in a 0.1 M phosphate buffer solution (pH 7.0) containing 0.2 mM DA at the various rotation rates indicated for each voltammogram. (B) Levich plots which drawn with using currents corresponding to $E_{\text{disk}} = 340$ mV and different concentrations of DA. Numbers of 1–4 correspond to 0.1, 0.2, 0.4 and 0.6 mM of DA. (C) Koutecky–Levich plots obtained from Levich plots shown in (B).

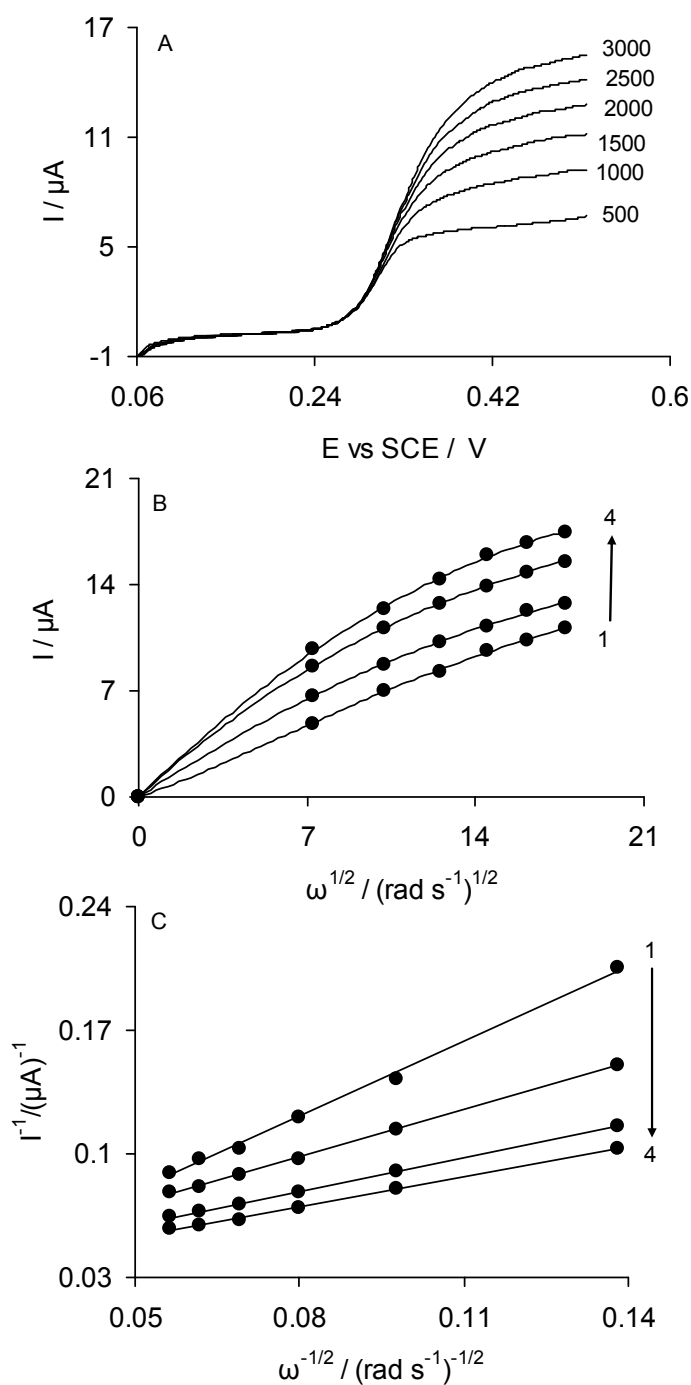


Fig. S9. (A) Typical steady-state voltammograms obtained for a RuON-GCE in a 0.1 M phosphate buffer solution (pH 7.0) containing 0.3 mM AC at the various rotation rates indicated for each voltammograms. (B) Levich plots which drawn with using currents corresponding to $E_{disk} = 374 \text{ mV}$ and different concentrations of AC. Numbers of 1–4 correspond to 0.3, 0.4, 0.5 and 0.6 mM of AC. (C) Koutecky–Levich plots obtained from Levich plots shown in (B).

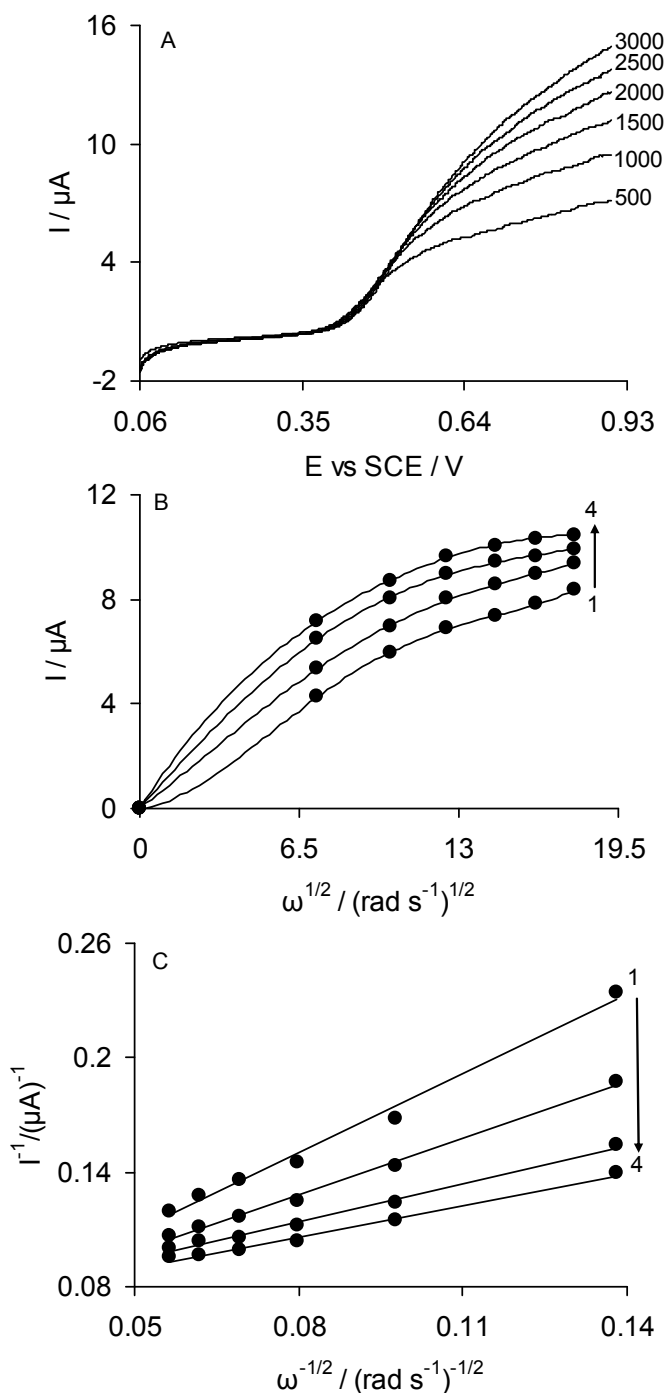


Fig. S10. (A) Typical steady-state voltammograms obtained for a BGCE in a 0.1 M phosphate buffer solution (pH 7.0) containing 0.3 mM AC at the various rotation rates indicated for each voltammograms. (B) Levich plots which drawn with using currents corresponding to $E_{disk} = 650$ mV and different concentrations of AC. Numbers of 1–4 correspond to 0.3, 0.4, 0.5 and 0.6 mM of AC. (C) Koutecky–Levich plots obtained from Levich plots shown in (B).

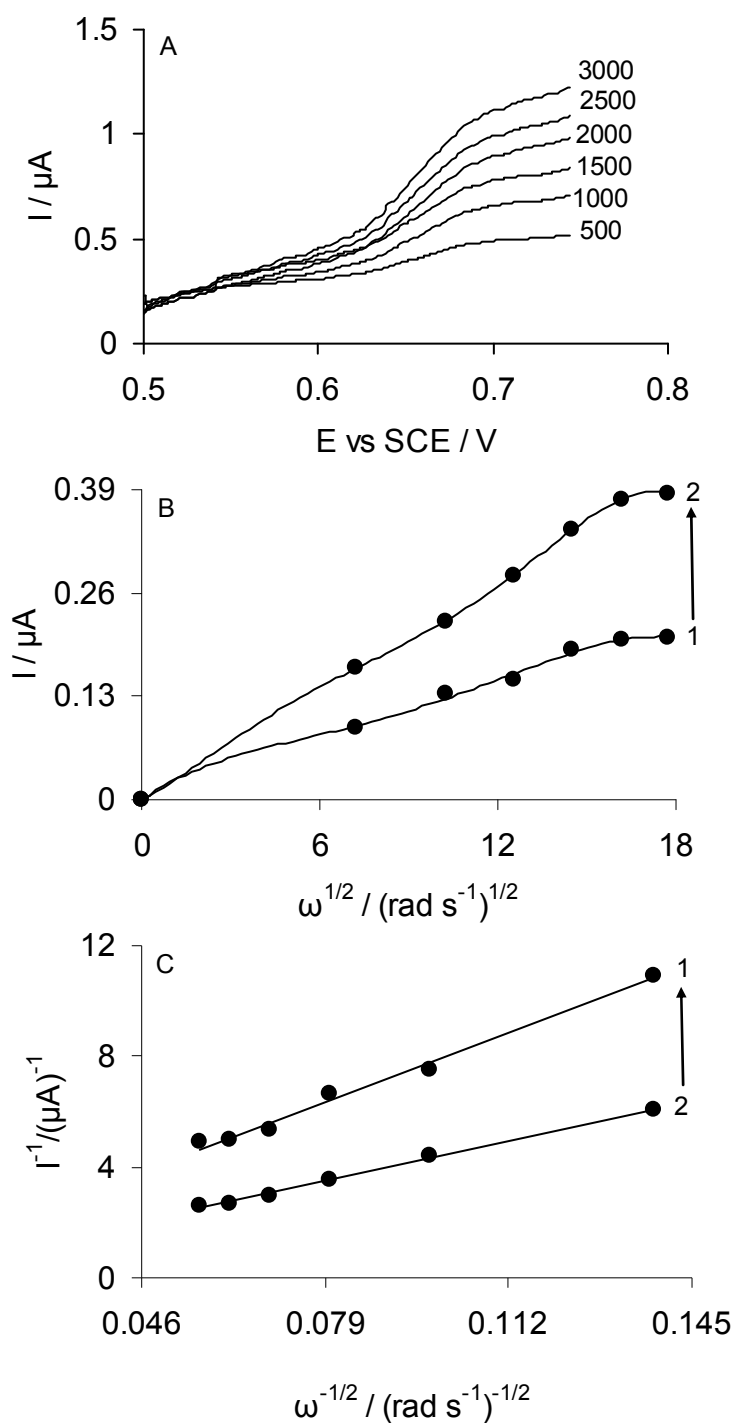


Fig. S11. (A) Typical steady-state voltammograms obtained for a RuON-GCE in a 0.1 M phosphate buffer solution (pH 7.0) containing 10.0 mM ASA at the various rotation rates indicated for each voltammograms. (B) Levich plots which drawn with using current corresponding to $E_{disk} = 700$ mV and different concentrations of ASA. Numbers of 1–2 correspond to 2.0 and 10.0 mM of ASA. (C) Koutecky–Levich plots obtained from Levich plot shown in (B).

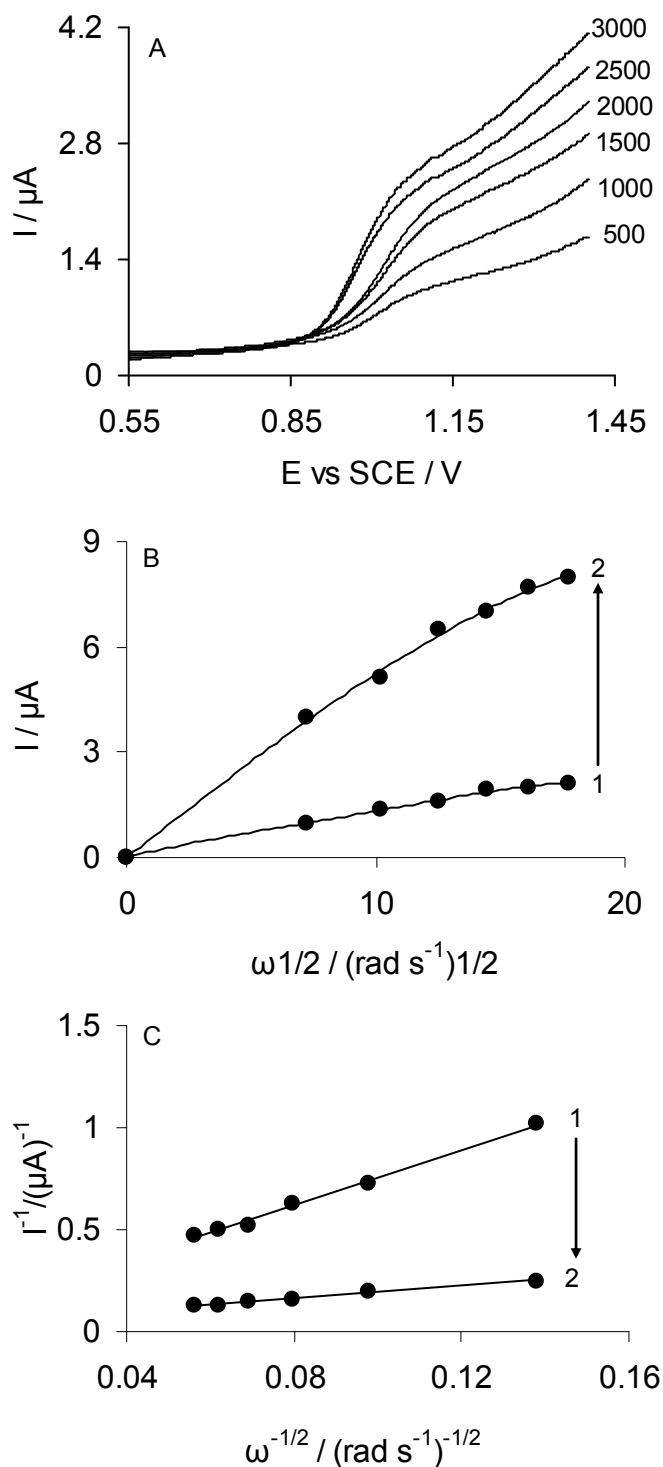


Fig. S12. (A) Typical steady-state voltammograms obtained for a BGCE in a 0.1 M phosphate buffer solution (pH 7.0) containing 10.0 mM ASA at the various rotation rates indicated for each voltammogram. (B) Levich plots which drawn with using current corresponding to $E_{\text{disk}} = 1172$ and different concentrations of ASA. Numbers of 1–2 correspond to 2.0 and 10.0 mM of ASA. (C) Koutecky–Levich plot obtained from Levich plot shown in (B).