

Poly(Thiophene)/Graphene Oxide-Modified Electrodes for Amperometric Glucose Biosensing

Maria I. Pilo ^{1,*}, Sylwia Baluta ², Anna C. Loria ¹, Gavino Sanna ¹ and Nadia Spano ¹

¹ Dipartimento di Scienze Chimiche, Fisiche, Matematiche e Naturali, Università di Sassari, Via Vienna 2, 07100 Sassari, Italy

² Faculty of Chemistry, Wrocław University of Science and Technology, Wybrzeże Wyspiańskiego 27, 50-370 Wrocław, Poland

* Correspondence: mpilo@uniss.it

Electrochemically-active surface area

The electrochemically-active surface area can be estimated by the slope of the curve I_p vs $v^{1/2}$ in a 0.1 M KCl solution containing 5 mM $[\text{Fe}(\text{CN})_6]^{3-/4-}$ using the Randles-Sevcik Equation (S1):

$$I_p = 2.69 \cdot 10^5 n^{3/2} A D^{1/2} C v^{1/2} \quad (\text{S1})$$

where I_p is the redox peak current in ampere, n is the number of exchanged electrons, A is surface area in cm^2 , D is the diffusion coefficient in $\text{cm}^2 \text{s}^{-1}$, C is the concentration of electroactive species in mol cm^{-3} , v is the potential scan rate in V s^{-1} .

Assuming $n = 1$ and $D = 6.5 \times 10^{-6} \text{ cm}^2 \text{ s}^{-1}$, the value of the active surface area for GC/poly(dTT-bT)/GrO/GOx has been estimated equal to 0.083 cm^2 , that is about twice than the value estimated for an unmodified GC electrode in the same conditions (0.035 cm^2).

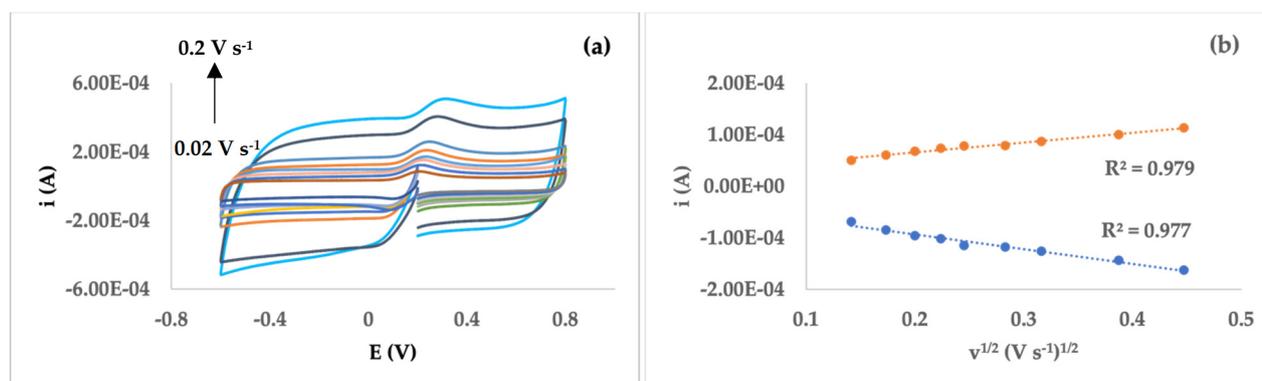


Figure S1. (a) Cyclic voltammograms of GC/poly(dTT-bT)/GrO/GOx in a 0.1 M KCl solution containing 5 mM $\text{K}_3[\text{Fe}(\text{CN})_6]$ at scan rates from 0.02 V s^{-1} to 0.2 V s^{-1} . (b) Relationship between the peak current and the square root of the potential scan rate.