

## Supplementary material

## Application of the Enzymatic Electrochemical Biosensors for Monitoring Non-Competitive Inhibition of Enzyme Activity by Heavy Metals

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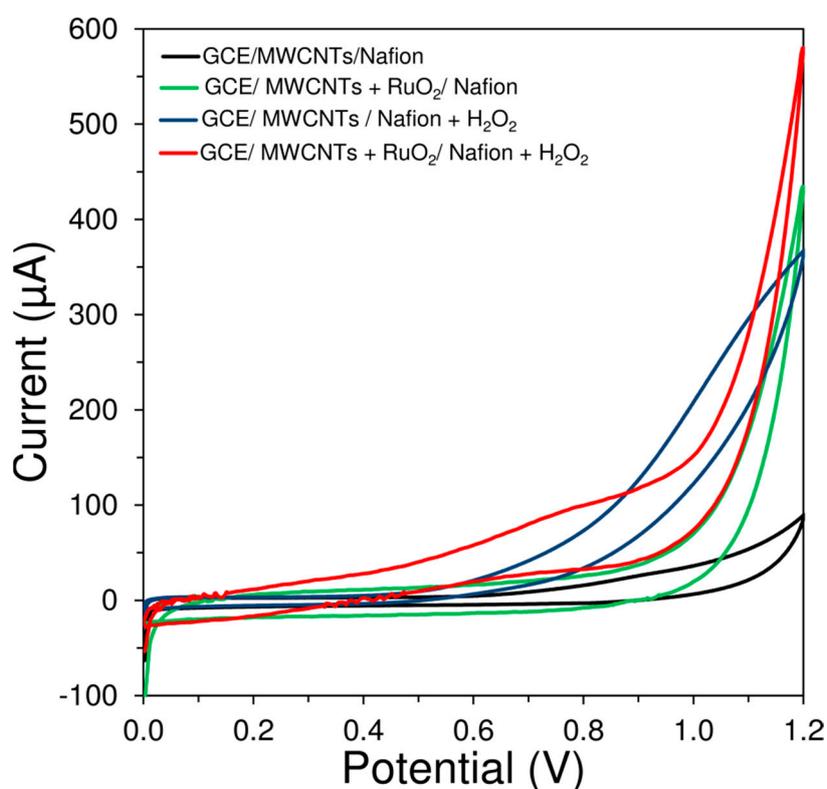
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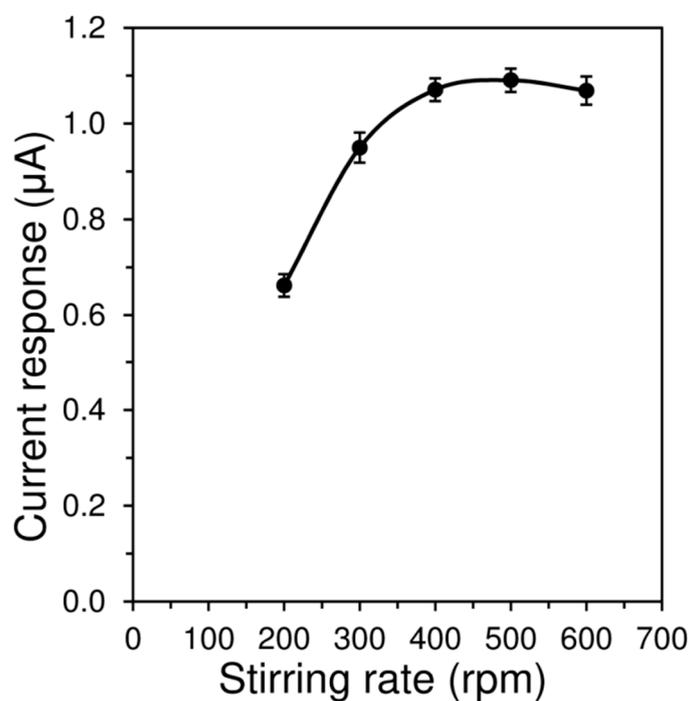
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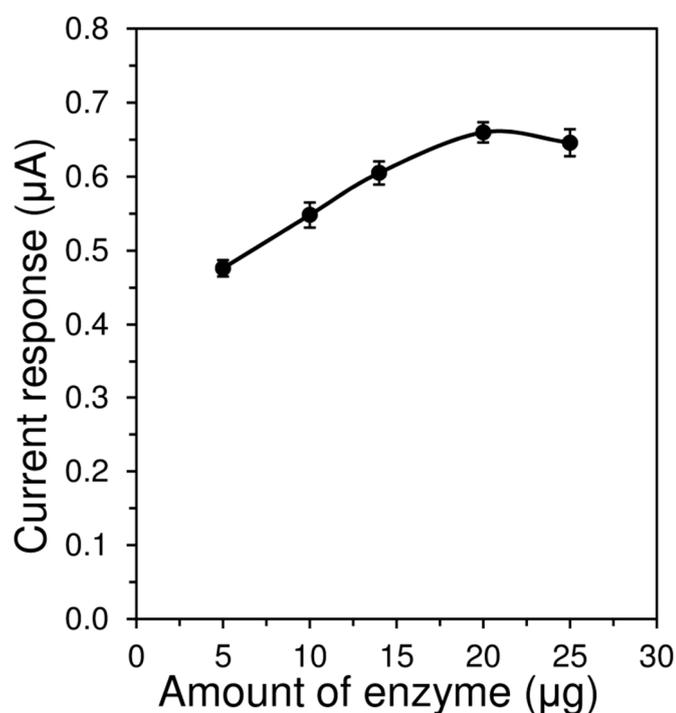
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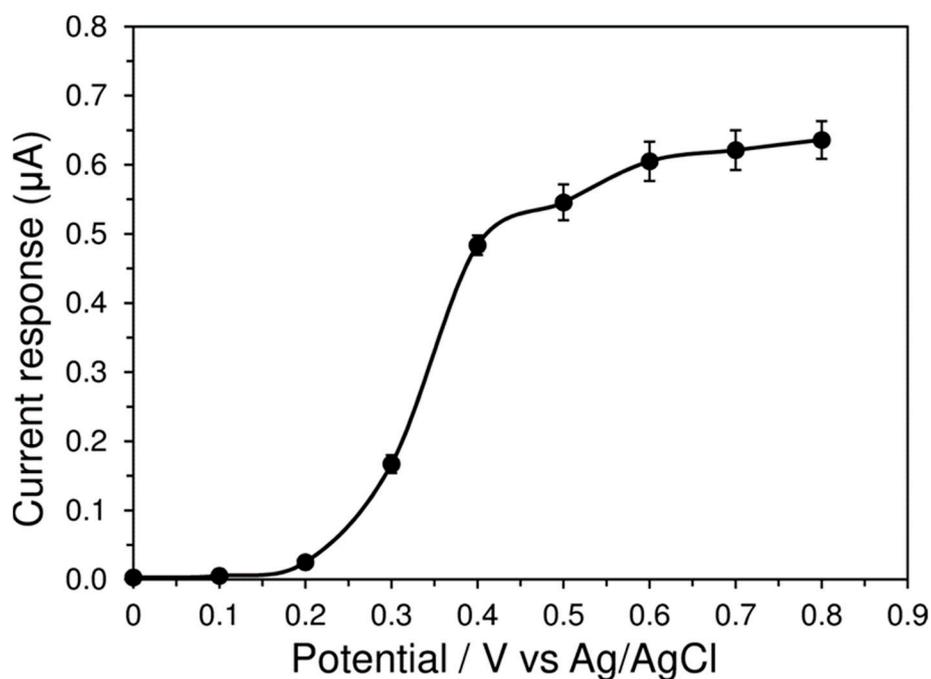
**Figure S1:** Cyclic voltammograms of 0.1 M phosphate buffer (blank) pH 7.0 and in presence of the  $5 \times 10^{-3}$  M of the  $\text{H}_2\text{O}_2$  obtained at different electrodes and at scan rate was  $50 \text{ mV s}^{-1}$ .



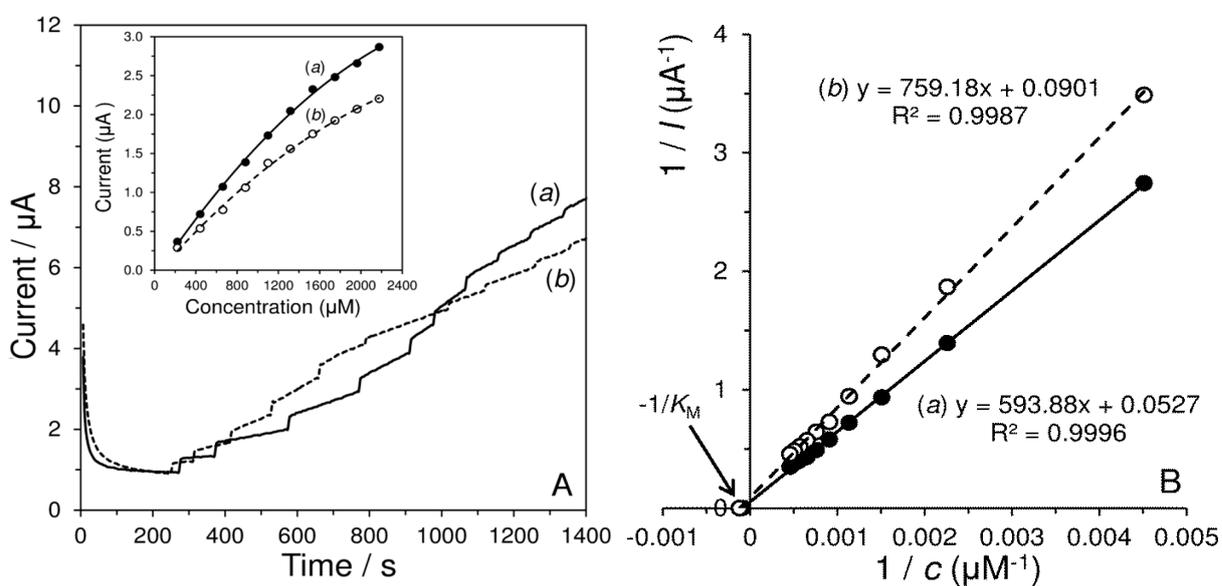
**Figure S2.** Effect of stirring rate on oxidation current response of 50  $\mu\text{M}$  hydrogen peroxide. Results were obtained from amperometric measurements (always for 5 repetitions) in the batch configuration at GCE/MWCNTs/Nafion<sup>®</sup> in 0.1 M phosphate buffer of pH 7.0 at potential +0.8 V.



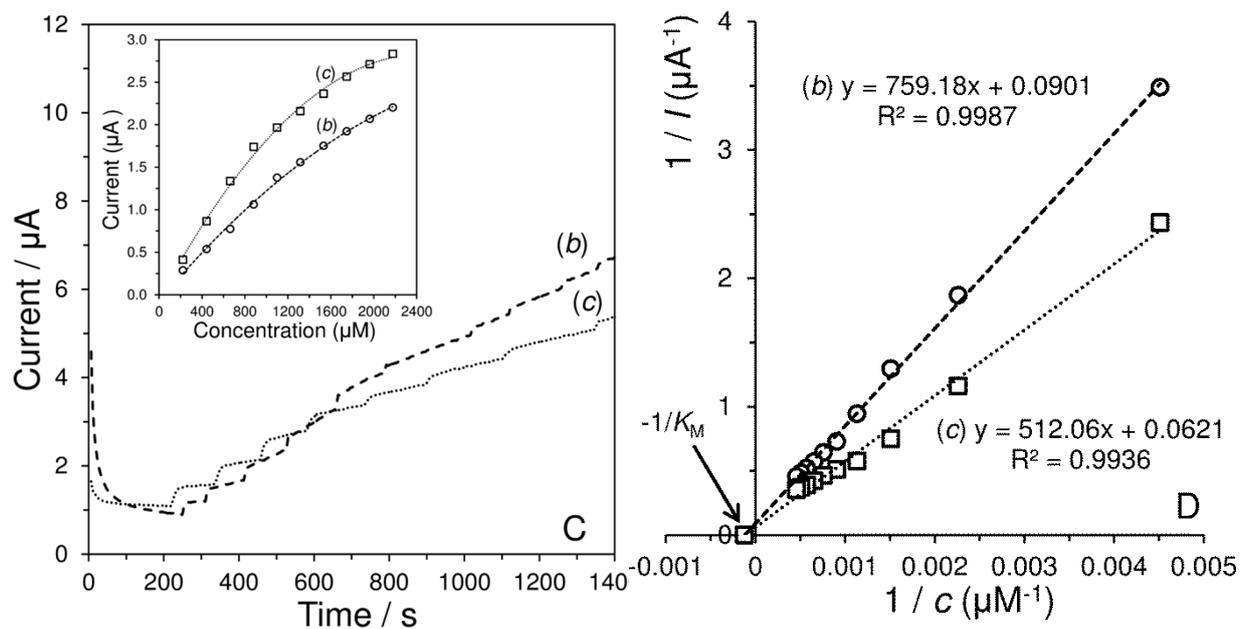
**Figure S3.** Effect of amount of the glucose oxidase from *Aspergillus niger* (EC 1.1.3.4) embedded in Nafion<sup>®</sup> membrane on current response of 200  $\mu\text{M}$  glucose. Results were obtained from amperometric measurements (always for 5 repetitions) in the batch configuration at GCE/MWCNTs/GOx/Nafion<sup>®</sup> in 0.1 M phosphate buffer of pH 7.0 at potential +0.8 V and stirring rate 400 rpm.



**Figure S4.** Effect of applied potential on current response of 150  $\mu\text{M}$  glucose. Results were obtained from amperometric measurements (always for 5 repetitions) in the batch configuration at GCE/MWCNTs/GOx-RuO<sub>2</sub>/Nafion® in 0.1 M phosphate buffer of pH 7.0 at potential +0.4 V and stirring rate 400 rpm.



**Figure S5.** Typical amperograms with corresponding calibration curves of glucose without (solid; *a*) and with content of 250  $\mu\text{M}$  Hg<sup>2+</sup> (dashed line; *b*) obtained at CPE/RuO<sub>2</sub>/GOx in 0.1 M phosphate buffer of pH 7.0 at potential +0.8 V and speed of stirring 400 rpm (A). Lineweaver-Burk plot confirmed noncompetitive inhibition of mercury (B).



**Figure S6.** Typical amperograms with corresponding calibration curves of glucose with content of 250  $\mu\text{M}$  Hg<sup>2+</sup> obtained at CPE/RuO<sub>2</sub>/GOx (dashed; *b*) and CPE/RuO<sub>2</sub>/GOx/Nafion® (dotted line; *c*) in 0.1 M phosphate buffer of pH 7.0 at potential +0.8 V and speed of stirring 400 rpm (*C*). Comparison of appropriate Lineweaver-Burk plots (*D*).