

Supplementary information

Wireless rotating bipolar electrochemiluminescence for dual enzymatic detection

Chunguang Li,^a Minghui Feng,^a Dalibor Stanković,^b Laurent Bouffier,^c Feifei Zhang,^{*a} Zonghua Wang^a and Neso Sojic^{*c}

^a College of Chemistry and Chemical Engineering, Shandong Sino-Japanese Center for Collaborative Research of Carbon Nanomaterials, Instrumental Analysis Center of Qingdao University, Qingdao University, Qingdao 266071, China

^b Institute of Chemistry, Technology and Metallurgy, National Institute University of Belgrade, 11000 Belgrade, Serbia

^c Univ. Bordeaux, Bordeaux INP, CNRS, UMR 5255, Site ENSCBP, 33607 Pessac, France

Corresponding authors: zhangfeifei@qdu.edu.cn; sojic@u-bordeaux.fr

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1. The time-dependent variations in average ECL intensity during rotation.

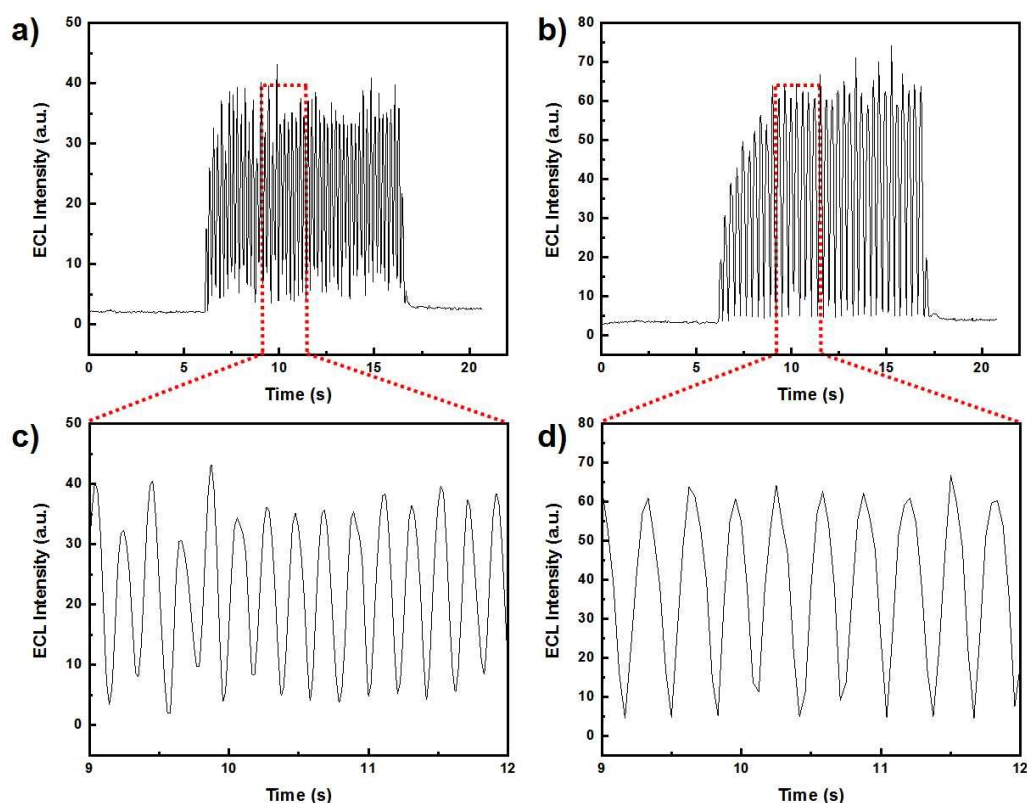


Figure S1. The time-dependent variations in average ECL intensity at the anodic pole during rotation for two distinct concentrations of glucose. An electric field is applied at $t = 6$ s. The ECL image used to measure the average ECL intensity is obtained at 150 rpm and $10 \text{ V} \cdot \text{cm}^{-1}$. The testing solution was composed of (a) 0.5 mM and (b) 1 mM glucose, 20 U/mL GOD and 1 mM L-012.

Figure S1 depicts the time-dependent variations in average ECL intensity at the anode end of the wire during rotation for two distinct concentrations of glucose. ECL emission is initiated upon the activation of the electric field at $t = 6$ s. A sequence of highly consistent ECL peaks emerge (Figure S1(a, b)) with relatively uniform peak heights, indicating the method's exceptional stability and reproducibility in generating ECL signal. Figure S1(c, d) allows visualizing better the shape of the peak: ECL intensity increased very rapidly and reached a plateau.

2. The change of peak ECL intensity with the applied potential and rotation speed of BPE.

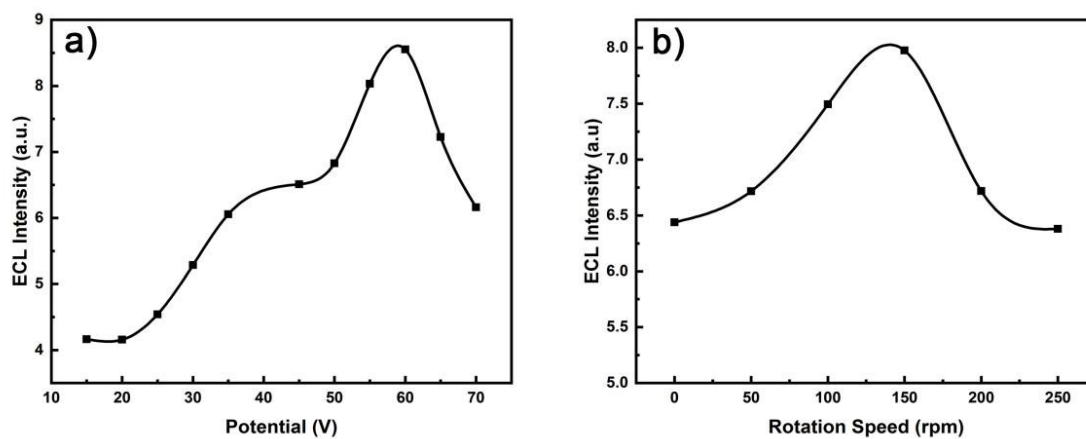


Figure S2. The change of peak ECL intensity with a) the applied potential and b) rotation speed of BPE. The solution consists of 1 mM glucose, 20 U/mL GOD and 1 mM L-012, with pH adjusted by NaOH solution.

3. Recovery rate.

The recovery rate was calculated as follows:

$$\text{The recovery rate} = \frac{\text{Estimated value} - \text{Original sample glucose content}}{\text{Addition of glucose}} \times 100\%$$