Title : Bipolar Electrochemiluminescence with laminated Stainless Steel Foil Electrode for Detection of Hydrogen Peroxide

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ABSTRACT

This study presents the development and application of laminated stainless steel foil electrode as a bipolar electrode (BPE) for bipolar electrochemiluminescence (bECL), with a smartphone used as the optical signal detection device. The electrode was fabricated using a simple and low-cost preparation process The developed bECL system was applied to the luminol/H_2O_2 reaction and demonstrated a linear relationship between bipolar electrochemiluminescence (bECL) intensity and hydrogen peroxide concentration over the range of 2–200 μM, with a limit of detection (LOD) of 5.7 μM. The proposed system emphasizes low cost, operational simplicity, and suitability for field applications, as it utilizes an inexpensive direct current power supply instead of a conventional potentiostat.

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