Electrodeposited Silver-Gold Alloy as A Sensor for Paracetamol Determination

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doi: 10.20964/2017.12.16

Received: 10 September 2017 / *Accepted:* 18 October 2017 / *Published:* 12 November 2017

In the present work, a composite Ag NPs/Au NPs bimetallic alloy was prepared via a one-step electrodeposition strategy. XPS and cyclic voltammogram (CV) measurements were carried out for the characterization of this composite. Paracetamol was successfully electrochemically detected using fabricated Au-Ag bimetallic alloy-modified ITO. Considering the excellent electronic features of these two metallic nanoparticle materials, the electrochemical response of paracetamol was found substantially enhanced by the Au-Ag bimetallic alloy, as shown in the CV experiment results. Optimization of the corresponding parameters was also carried out. It was found that paracetamol showed amperometric oxidation currents linearly related to the concentrations (0.01 - 1 mM), and the limit of detection (LOD) was obtained as 2.4 μ M based on a sound to noise ratio of 3. In addition, our developed sensor proved highly reproducible and stable, and it displayed remarkable anti-interference properties; thus, it has the potential for applications in the detection of paracetamol in tablets and spiked human urine specimens.

Keywords: Paracetamol; Bimetallic alloy; Electrodeposition; Electrochemical determination; Tablet

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