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Electrodeposition of gold on oxidized and reduced graphite surfaces and its influence on glucose oxidation

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Abstract

Gold surfaces have been extensively studied to achieve glucose oxidation for such applications as fuel cells or sensors. However, obtaining structures with high catalytic activity requires complex techniques for their synthesis. In this study, we propose a simple method to obtain gold architectures with high catalytic activity for glucose oxidation based on previous electrooxidation and electroreduction of graphite surfaces. The graphite (Gt) surfaces were electrochemically treated by the chronoamperometry technique obtaining graphite oxide GtO and reduced graphite oxide rGtO and these were characterized by Raman spectroscopy for determined to exhibit oxygen–containing functional groups. Subsequently, gold was electrodeposited on the previously modified graphitic surfaces by cyclic voltammetry and physicochemically characterized by SEM, XRD and AFM. XRD analysis and electrochemical profiles confirm that Au-Gt favours the presence of the [111]