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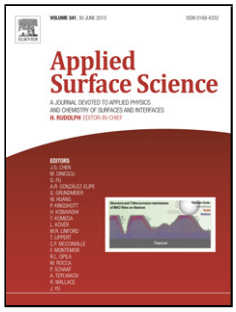

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ACCEPTED MANUSCRIPT

Facile one-step electrochemical deposition of copper nanoparticles and reduced graphene oxide as nonenzymatic hydrogen peroxide sensor

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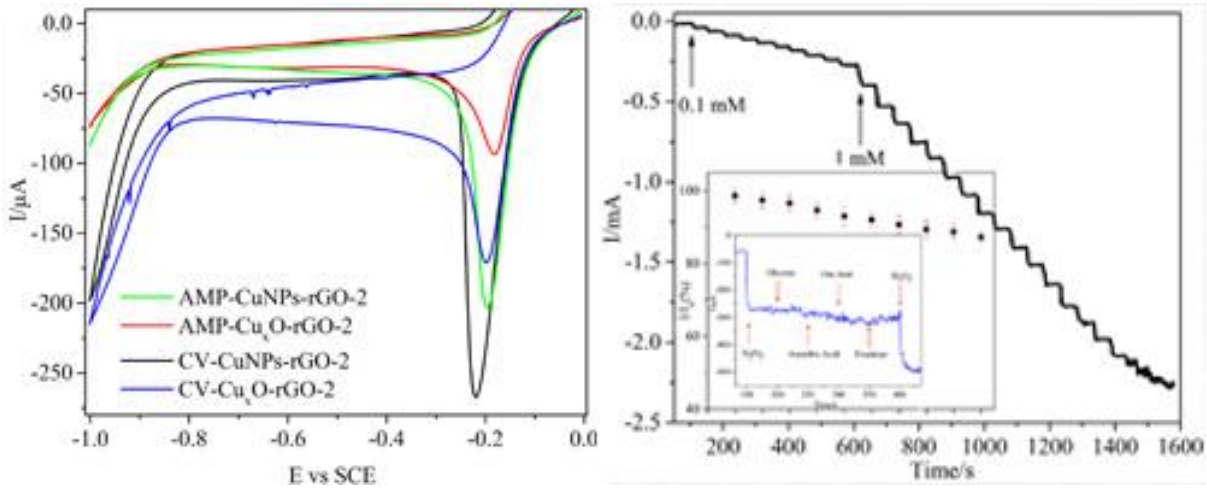
Graphical Abstract



Highlights

- Simultaneous reduction and deposition of graphene oxide and copper nanoparticles.
- Deposition of graphene oxide and copper nanoparticles via electrochemical process.
- Investigating the effect of electrodeposition technique (cyclic voltammetry and chronoamperometry) on the electrode's morphology.
- The senor shows superior performances (LOD, LOQ, selectivity, repeatability, reproducibility and stability) towards H_2O_2.

Abstract

For several decades, hydrogen peroxide has exhibited to be an extremely significant analyte as an intermediate in several biological devices as well as in many industrial systems. A straightforward and novel one-step technique was employed to develop a sensitive non-enzymatic hydrogen peroxide (H_2O_2) sensor by simultaneous electrodeposition of copper nanoparticles (CuNPs) and reduced graphene oxide (rGO). The electroreduction performance of the CuNPs-rGO for hydrogen peroxide detection was studied by cyclic voltammetry (CV) and chronoamperometry (AMP) methods. The CuNPs-rGO showed a synergistic effect of reduced graphene oxide and copper nanoparticles towards the electroreduction of hydrogen peroxide, indicating high reduction current. At detection potential of -0.2 V, the CuNPs-rGO

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