The Preparation of Ag Nanoparticles/Graphene Nanocomposites with Polydopamine as Coupling Agent for Enhanced Detection of H₂O₂

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doi: 10.20964/2019.07.30

Received: 1 March 2019 / Accepted: 22 April 2019 / Published: 10 June 2019

In this paper, a new Ag nanoparticles (AgNPs)/graphene nanocomposites with polydopamine (PDA) as coupling agent was electrochemically synthesized and has been used as electrode modifications for the electrochemical detection of H₂O₂. The structural characterizations clearly showed that small sized and highly dispersed AgNPs were electrodeposited on reduced graphene oxide (RGO) with the help of PDA agent. The obtained AgNPs/PDA/RGO nanocomposites exhibited higher electrocatalytic activities toward reduction of H₂O₂ compared with the AgNPs/RGO composites without involvement of PDA. The AgNPs/PDA/RGO nanocomposites presented excellent electrochemical sensing performance for detection of H₂O₂ with wide linear concentration range, high detection sensitivity, good selectivity and excellent reproducibility and stability. The successful application of AgNPs/PDA/RGO nanocomposites in human serum samples for the detection of H₂O₂ was also demonstrated.

Keywords: Silver nanoparticles; Graphene; Hydrogen peroxide; Polydopamine; Electrochemical sensor

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