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One-pot synthesis of Ag nanoparticles/reduced graphene oxide nanocomposites and their application for nonenzymatic H2O2 detection

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Abstract

In this paper, we report on one-pot synthesis of Ag nanoparticles/reduced graphene oxide (AgNPs/rGO) nanocomposites by heating mixed solution of graphene oxide (GO) and AgNO₃ with the use of diethylenetriamine as a reducing agent at 80 degrees C for 30 min. Several analytical techniques including UV-vis spectroscopy, Raman spectroscopy and transmission electron microscopy (TEM) have been employed to characterize the resulting nanocomposites. It was found that such nanocomposites exhibit good catalytic activity toward the reduction of H₂O₂. This nonenzymatic H₂O₂ sensor shows a fast amperometric response time of less than 2s. The linear detection range is estimated to be from 0.1 to 100 mM (r = 0.999), and the detection limit is estimated to be 3.6 μM at a signal-to-noise ratio of 3. (C) 2012 Elsevier Ltd. All rights reserved.

Keywords

Author Keywords: Ag nanoparticles; Reduced graphene oxide; One-pot; H2O2 detection

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