Voltammetric Analysis of As(III) at a Cobalt Nanoparticles/Reduced Graphene Oxide Modified Exfoliated Graphite Electrode

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This work presents the detection and quantification of As(III) at an exfoliated graphite electrode (EG) modified with a composite of cobalt nanoparticles and reduced graphene oxide. The materials were characterised by Raman spectroscopy and scanning electron microscopy & energy dispersive spectroscopy. Modification of the surface of EG with the composite material led to significant improvement in its electro-active surface area and thus electrocatalytic activity. The sensor was utilised for the voltammetric analysis of As(III) in standard and real samples and the limit of detection and limit of quantification were found to be 0.31 and 1.01 ppb respectively, under optimum conditions. The proposed device can be employed for practical analytical purposes.

Keywords: Arsenic, voltammetric detection, cobalt nanoparticles, reduced graphene oxide, exfoliated graphite electrode.

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