Preparation of Graphene-Copper Nanocomposite for Electrochemical Determination of Cadmium Ions in Water

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doi: 10.20964/2017.09.12

Received: 27 February 2017 / Accepted: 21 June 2017 / Published: 13 August 2017

Films of a graphene/copper composite in a copper matrix were deposited on ITO using an aqueous electrolyte solution containing 0.2 M CuSO₄ and a graphene oxide suspension at a low current density. Using a further calcination of the specimens under a flowing hydrogen atmosphere, graphene oxide was reduced. After this, the detection of cadmium(II) using square-wave voltammetry (SWV) on the Cu-graphene/ITO film was illustrated. This approach utilized ion accumulation on the Cu-graphene/ITO film. The performance of the Cu-graphene/ITO film was optimized by surface modification and changing the operating conditions.

Keywords: Graphene; Copper; Nanocomposite; Cadmium ions; Electrochemical sensor; Water

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