Simultaneously Detection of Pb^{2+} and Hg^{2+} Using Electrochemically Reduced Graphene Oxide

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In this work, graphene oxide (GO) was electrochemically reduced on the surface of glassy carbon electrodes (GCE) to fabricate a sensitive sensor for rapidly simultaneous determination of lead(II) and mercury (II) in water. The electrochemically reduced graphene oxide (ERGO) modified GCE exhibited enhanced analytical performance toward Pb^{2+} and Hg^{2+} because of the remarkable surface area, fantastic electrical conductivity and great adsorptive capability of ERGO. The peak currents at about -0.18 V for Cu^{2+} and 0.08 V for Hg^{2+} were measured. The concentration of GO, deposition potential and accumulation time was investigated. Under optimum conditions, the limit of detection (LOD) for the ERGO modified GCE (ERGO/GCE) toward Pb^{2+} and Hg^{2+} is 0.2 ng/mL and 1 ng/mL respectively, and the linear range of Pb^{2+} and Hg^{2+} is 1~1000 ng/mL and 1~1000 ng/mL. The ERGO modified electrode exhibited great repeatability and reproducibility, making it applicable for the fast simultaneous detection of lead (II) and mercury (II) in actual samples.

Keywords: Electrochemically reduced graphene oxide; Pb(II); Hg(II); square wave voltammetry

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