Electrochemical Sensing Application of Isorhamnetin: Detecting Hg^{2+} as an Example

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doi: 10.20964/2018.05.77

Received: 29 January 2018 / Accepted: 9 March 2018 / Published: 10 April 2018

Isorhamnetin as a natural product has excellent biological activity, but there are few reports of it in electrochemical applications. In this paper, we developed a neoteric electrochemical sensor for sensitive detection of mercury ions (Hg^{2+}) for the first time using glassy carbon (GC) electrode which was modified with isorhamnetin (ISO) and graphene oxide (GO). The electrochemical behaviors of the fabricated GC electrode were characterized by cyclic voltammetry (CV) and differential pulse voltammetry (DPV). Under optimal conditions, the linear range to detect Hg^{2+} with DPV was from 1.0×10^{-6} to 1.0×10^{-4} M with limit detection of 2.3×10^{-8} M (S/N=3). In addition, it also showed excellent selectivity of Hg^{2+} with comparison to several inorganic salt ions and other metal ions. We also report the application for Hg^{2+} detection in real water samples with a good recovery (92.1-104.7%). In conclusion, isorhamnetin can be applied in the electrochemical field successfully with extraordinary results.

Keywords: Isorhamnetin, Graphene oxide, Electrochemical application, Mercury ion

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