Electrochemical determination of copper(II) using modified glassy carbon electrodes

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ABSTRACT

Electrochemical modification of glassy carbon (GC) electrode surface via electrochemical oxidation of 1-aminoindan in acetonitrile including 100.0 mM of tetrabutylammonium tetrafluoroborate and applicability of electrode modified in this way for electrochemical determination of copper(II) (Cu(II)) were reported in this study. Electrochemical surface modification was performed by cyclic voltammetry in the potential range between +0.9 and +1.5 V vs. Ag/Ag+ (10.0 mM of AgNO3) at the scan rate of 100 mV/s by 30 potential cycles. The modified electrode surface was characterized by cyclic voltammetry, electrochemical impedance spectroscopy and contact angle measurement. The characterization results were compared with the characterization results of bare GC electrode. The results of the amperometric measurements of the modified GC electrode towards Cu(II) ions were investigated. It was determined that the modified electrode surface had electrochemical responses towards Cu(II) ions with high sensitivity, good selectivity, stability, reproducibility and repeatability. According to the results, it is believed that it will be possible to find an application area for this new surface in any industrial fields.

Keywords: Heavy metal; Copper; Electrochemical treatment; Metal determination; Glassy carbon

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