



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

Esra Bilici^a, Zafer Yazicigil^{a,*}, Mutahire Tok^a, Yasemin Oztekin^{a,b}

^a*Faculty of Science, Department of Chemistry, Selcuk University, Konya, Turkey
Tel. +90 332 2233900; Fax: +90 332 2412499; email: zfyazicigil@gmail.com*

^b*Faculty of Chemistry, Center of Nanotechnology and Material Science, Vilnius University, Vilnius, Lithuania*

Received 30 November 2011; Accepted 27 June 2012

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

*Corresponding author.