Modification of Chitosan/MWCNTs nanocomposite for Lead (II) and Cadmium (II) Detection in Application of Disposable Electrochemical Sensor

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Abstract

This study was investigated an ongoing research on the development of rapid, low-cost and friendly-use techniques with modification of chitosan and multi-wall carbon nanotubes (MWCNTs) nanocomposite for trace heavy metals, such as lead (II) and cadmium (II) detection by square wave stripping voltammetry. It was conducted using glassy carbon electrode (GCE), while a highly porous surface with an orderly three-dimensional network sensing layer (chitosan-MWCNTs) was fabricated by electro-deposition. The results shows that the peak potential of the reoxidation of Cd is -0.74 V, and of Pb -0.51 V vs. Ag/AgCl. The correlation coefficient (R^2) of the calibration curves was 0.996 (for Cd) and 0.995 (for Pb) with the same linear range (from 0.5 to 2 ppm).

It was especially electrochemical methods, are widely recognized as a powerful tool for the simultaneous determination of multiple types of metal ion, because of the combination of an effective pre-concentration step with advanced electrochemical measurements of the accumulated analystes. The chitosan-MWCNTs/GCE modified electrode could be applied on the analysis of drinking water and mineral water.

Keywords: Electrochemical Sensor; chitosan; multi-wall carbon nanotubes lead; cadmium