Synthesis of a Schiff Base for Carbon Sphere Modification and Cd²⁺ Electrochemical Determination

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In this work, a novel carbon paste electrode was chemically modified by 2-(2-hydroxyphenyl)-2,5-diaza-4,6-dimethyl-8-hydroxy-1,5,7-nonatriene (SB)-coated carbon spheres, which showed excellent performance in the detection of cadmium via square-wave anodic stripping voltammetry (SWASV) with exceptional speed, simplicity, accuracy, selectivity, and sensitivity. Cyclic voltammetry (CV) and electrochemical impedance spectroscopy (EIS) measurements were then carried out for the characterization of this modified electrode. Our proposed electrode was successfully used for the detection of Cd(II) in human plasma specimens. For Cd(II), the limit of detection (LOD) was calculated as 4.6 pM (based on a signal to noise ratio of 3), and the linearity range was found to be 10–250 pM.

Keywords: Schiff bases; Electrochemical determination; Cd ions; Human serum; Carbon sphere

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