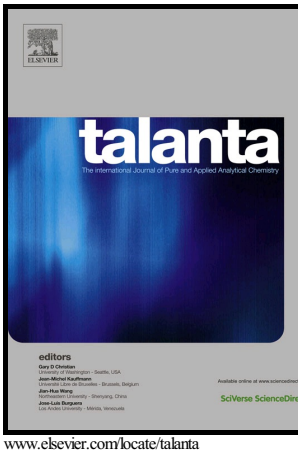

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Development and characterization of an electrochemical sensor for furosemide detection based on electropolymerized molecularly imprinted polymer

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ABSTRACT

A novel electrochemical sensor based on a molecularly imprinted polymer, poly (o-phenylenediamine) (PoPD), has been developed for selective and sensitive detection of furosemide. The sensor was prepared by incorporating of furosemide as template molecules during the electropolymerization of o-phenylenediamine on a gold electrode. To develop the molecularly imprinted polymer (MIP), the template molecules were removed from the modified electrode's surface by washing it with 0.25 mol L^{-1} NaOH solution. The imprinted layer was characterized by cyclic voltammetry (CV), electrochemical impedance spectroscopy (EIS) and atomic force microscopy (AFM). The sensor's preparation conditions including furosemide concentration, the number of CV cycles in the electropolymerization process, extraction solution of the template from the imprinted film, the incubation time and the pH level were optimized. The incubation of the MIP-modified electrode, with respect to furosemide concentration, resulted in a suppression of the $K_4[Fe(CN)_6]$ oxidation process. Under the optimal experimental conditions, the response of the imprinted sensor was linear in

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