Electrochemical Sensor Based on Self-doped Polyaniline with Guest-induced Binding Sites for Detection of Lead(II) Ion

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An electrochemical approach towards developing a lead(II) ion selective polymer is presented. A poly(aniline-co-3-aminobenzenesulfonic acid), P(Ani-co-3ABSA), membrane would be reconciled with the peculiarities of lead(II) ions by incorporating them. It seems that consecutive embedding/ejecting of lead(II) into-from the mass of P(Ani-co-3ABSA) coating, correspondingly templates the coating towards lead(II) ion. This method results in a highly selective sensor for the measurement of lead(II) ion. The optimal conditions for sensor operation were ascertained. The surface morphology of the freshly synthesized, templated and templated-preconcentrated P(Ani-co-3ABSA) membranes were explored by SEM. The interference effect on the voltammetric response with coexisting ions was also investigated. The developed sensor was applied for lead(II) determination by pre-concentration/differential pulse-anodic stripping voltammetry in concentrations of 1.0 nM to 0.1 mM and by potentiometric method in concentrations of 10.0 nM to 1.0 mM.

Keywords: Self-doped polyaniline; Recognition elements; Pb measurement; voltammetry; potentiometry

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