The Electrochemical Analysis of Cadmium in Choline Chloride/Urea Deep Eutectic Solvent Electrolyte at Carbon Nanotubes Modified Electrode

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The electrochemical behavior of Cd at choline chloride/urea electrolyte and multi-wall carbon nanotubes modified electrode was investigated by cyclic voltammetry (CV) and differential pulse voltammetry (DPV). A couple of sensitive and quasi-reversible redox peaks of Cd was obtained with -0.75 V of oxidation peak potential (E_{pa}) and -0.91 of reduction peak potential (E_{pc}) ($\Delta E = 0.16$ V) in choline chloride /urea ionic liquids and $0.1\text{ mol}\cdot\text{L}^{-1}$ HAc-NaAc mixed buffer system (pH 5.4). A sensitive DPV method for the determination of Cd was proposed. The oxidation peak was linearly related to the concentration of Cd in the range of 6.0×10^{-4} – 1.5×10^{-2} $\mu\text{g}\cdot\text{mL}^{-1}$, the detection limit was 6.8×10^{-5} $\mu\text{g}\cdot\text{mL}^{-1}$. The proposed method is quick, sensitive, reliable and can be used for the determination of Cd in environment and food.

Keywords: Cd; Choline chloride/urea solvent; Electrolyte; Multi-wall carbon nanotubes; Cyclic voltammetry; Differential pulse voltammetry.

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