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Differential Pulse Polarographic Determination of Cadmium After Solid Liquid Extraction and Preconcentration Using PAN

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Abstract: A highly selective, sensitive, rapid and economical differential pulse polarographic method has been developed for the determination of trace amounts of cadmium in various samples after the adsorption of its 1-(2-pyridylazo)-2-naphthol (PAN) complex on microcrystalline naphthalene in the pH range of 8.2-11.0. After filtration, the solid mass is shaken with 9.0 mL of 1 M hydrochloric acid and cadmium is determined by differential pulse polarography. Cadmium can alternatively be quantitatively adsorbed on [1-(2-pyridylazo)-2-naphthol]-naphthalene adsorbent packed in a column and determined similarly. The detection limit is 0.07 μ g/mL (signal-to noise ratio = 2) and the linearity is maintained in the concentration range 0.1-150 μ g/mL with a correlation coefficient of 0.9995 and relative standard deviation of \pm 0.98%. Characterization of the electroactive process included an examination of the degree of reversibility. Various parameters such as the effect of pH, volume of aqueous phase and interference of a number of metal ions on the determination of cadmium have been studied in detail to optimize the conditions for determination in various samples.

Key Words: Trace cadmium determination, differential pulse polarography, 1-(2-pyridylazo)-2-naphthol

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