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SOLID PHASE EXTRACTION AND FLAME ATOMIC ABSORPTION DETERMINATION OF CADMIUM IN WATER SAMPLES

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A new sensitive and selective method including solid phase preconcentration and next determination of trace amounts of Cd(II) by flame atomic absorption spectroscopy in water samples was developed. Cadion was coated on carbon active powder and used as a solid phase sorbent. Detection limit for extraction of 2000 ml aqueous solution is 0.35 μg·L^{-1}. The relative standard deviations for concentrations 2.5 and 15 μg·L^{-1} with preconcentration factor 200; 0.4 and 0.2% (n = 3) were obtained, respectively. The calibration curve is linear in the range of 1.5 – 15 μg·L^{-1}. The accuracy of the method was evaluated and confirmed by the inductively coupled plasma atomic emission spectrometric analysis. Method was applied for the determination of cadmium in well water.

Keywords: preconcentration, cadion, solid phase extraction, Cd (II).

Introduction

Cadmium has been described as one of the most dangerous trace metals in the environment, not only because of its high level toxicity, but also because of its wide distribution and its many important applications. The maximum permissible level of cadmium in drinking water is 5.0 μg·L^{-1} [1]. Therefore determination of trace amounts of cadmium in environmental samples is of great importance. Different analytical techniques have been performed to determine cadmium in various samples including flame atomic absorption spectrometry (FAAS) [2 – 4], inductively coupled plasma emission spectrometry (ICP-OES) [5, 6], and electrochemical techniques [7, 8]. FAAS has been widely used for determination of trace quantities of cadmium because of the low cost, operational facility and high sample throughput. The interfering effects of the matrix components of the samples are the one of the main problems in the determination of traces of

Conclusions

Utilization of cadion coated carbon powder as solid phase for efficient preconcentration of Cd(II) makes it possible to measure ppb level of cadmium ions in water samples by flame atomic absorption technique. The present method is selective, sensitive and accurate with enough low detection limit so it could be used for the determination of Cd(II) in water samples.

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