SOLID PHASE EXTRACTION OF CD (II) USING XAD-7 SORBENT PRIOR TO ATOMIC ABSORPTION SPECTROSCOPY

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Cadmium is an important constituent widely used in different industrial processes for production of various synthetic materials. For evaluation of workers' exposure to trace toxic metal of Cd (II), environmental and biological monitoring are essential processes, in which, preparation of samples is one of the most time-consuming and error-prone aspects prior to analysis. To evaluate factors influencing quantitative analysis scheme of cadmium, solid phase extraction using mini columns filled with XAD-7 resin was optimized regarding sample pH, ligand concentration, loading flow rate, elution solvent, sample volume (up to 500 ml), elution volume, amount of resins, and sample matrix interferences. Cadmium ion was retained on solid sorbent and was eluted with 2M HNO_3 followed by simple determination of analytes by using flame atomic absorption spectrometery. Obtained recoveries of metal ion were more than 95%. The amount of the analyte detected after simultaneous pre-concentration was basically in agreement with the added amounts. The optimized procedure was also validated with three different pools of spiked urine samples and showed a good reproducibility over six consecutive days as well as six within-day experiments. The developed method promised to be applicable for evaluation of other metal ions present in different environmental and occupational samples as suitable results were obtained for relative standard deviation (less than 10%), therefore, it is concluded that, this optimized method can be considered to be successful in simplifying sample preparation for trace residue analysis of Cd in different matrices for evaluation of occupational and environmental exposures.

Biography

Professor Seyed Jamaleddin Shahtaheri has been Graduated from Surrey University, Guildford, England as PhD in 1996, with the specialties including sample preparation techniques for environmental and biological samples with subjects "trace residue analysis of pesticides" and then started working at the Tehran University of Medical Sciences, Tehran. Iran where he has continued his research. presently he has been working at the at the Tehran City.

Keywords: Cadmium, sample preparation, atomic absorption spectrometry, trace residue analysis

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