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### Analytical Methods

A solid phase extraction procedure for the determination of Cd(II) and Pb(II) ions in food and water samples by flame atomic absorption spectrometry

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9 **A B S T R A C T**

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11 A relatively rapid, accurate and precise solid phase extraction method is presented for the  
12 determination of cadmium(II) and lead(II) in various food and water samples. Quantitation is  
13 carried out by flame atomic absorption spectrometry (FAAS). The method is based on the  
14 retention of the trace metal ions on Dowex Marathon C, a strong acid cation exchange resin.  
15 Some important parameters affecting the analytical performance of the method such as pH, flow  
16 rate and volume of the sample solution; type, concentration, volume, flow rate of the eluent; and  
17 matrix effects on the retention of the metal ions were investigated. Common coexisting ions did  
18 not interfere on the separation and determination of the analytes. The detection limits ( $3\sigma_b$ ) for  
19 Cd(II) and Pb(II) were found as 0.13 and 0.18  $\mu\text{g L}^{-1}$ , respectively, while the limit of  
20 quantification values ( $10\sigma_b$ ) were computed as 0.43 and 0.60  $\mu\text{g L}^{-1}$  for the same sequence of the  
21 analytes. The precision (as relative standard deviation) was lower than 4% at 5  $\mu\text{g L}^{-1}$  Cd(II) and  
22 10  $\mu\text{g L}^{-1}$  Pb(II) levels, and the preconcentration factor was found to be 250. The accuracy of the  
23 proposed procedure was verified by analyzing the certified reference materials, SPS-WW2 Batch  
24 108 wastewater level 2 and INCT-TL-1 tea leaves, with the satisfactory results. In addition, for  
25 the accuracy of the method the recovery studies ( $\geq 95\%$ ) were carried out. The method was  
26 applied to the determination of the analytes in the various natural waters (lake water, tap water,  
27 waste water with boric acid, waste water with  $\text{H}_2\text{SO}_4$ ) and food samples (pomegranate flower,  
28 organic pear, radish leaf, lamb meat etc.), and good results were obtained. While the food

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