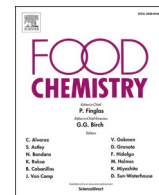




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A new analytical approach for preconcentration, separation and determination of Pb(II) and Cd(II) in real samples using a new adsorbent: Synthesis, characterization and application

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ABSTRACT

A green and efficient analytical approach was reported for simultaneous preconcentration, and separation of Pb (II) and Cd(II) in water, vegetables, and barbecue samples by dispersive solid-phase microextraction prior to their determination using flame atomic absorption spectrometry. A new poly-3-hydroxy butyrate-polyvinyl triethyl ammonium chloride comb-type amphiphilic cationic block copolymer (PHBvbNCl) was synthesized and characterized. Main variables such as pH, sorbent amount, adsorption time, eluent type, desorption time, and sample volume were optimized. Detection limits and working ranges for Pb(II) and Cd(II) were $0.03 \mu\text{g L}^{-1}$, $0.15 \mu\text{g L}^{-1}$, $0.1\text{--}250 \mu\text{g L}^{-1}$ and $0.5\text{--}375 \mu\text{g L}^{-1}$, respectively. Enhancement factor for Pb (II) and Cd (II) were 114 and 98. The adsorption capacity of PHBvbNCl for Pb(II) and Cd(II) was 175.2 mg g^{-1} and 152.9 mg g^{-1} . After the accuracy of the method was confirmed by the analysis of certified reference materials, it was successfully applied to real samples. Finally, the analytical performance of the present method was compared with other methods.