



Chemically modified nano silica gel with 2-((3silylpropylimino) methyl)-2-hydroxy-1-naphthol (SPIMHN) as good and efficient adsorbent for solid phase extraction

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ABSTRACT

A new selective solid phase extractor was prepared based on modification of silica gel with 2-((3silylpropylimino) methyl)-2-hydroxy-1-naphthol (SPIMHN). The solid phase extractor is stable in 6 mol/L HCl, common organic solvents, and buffer solutions at pH 2.0–8.0. This new sorbent was successfully applied for the enrichment of trace amount of Fe³⁺, Pb²⁺, Cu²⁺, Ni²⁺, Co²⁺, and Zn²⁺ ions subsequent their determination by flame atomic absorption spectrometry. The influences of the analytical parameters including pH, ratio of aminopropylsilylate to 2-hydroxy-1-naphthaldehyde and amount of solid phase, sample flow rate, eluent solution conditions (type, concentration, and volume), and sample volume on the metal ions recoveries were investigated. The method has high sorption—preconcentration efficiency even in the presence of various interfering ions (recoveries between 98 and 99.4 and detection limits in the range of 1.3–2.8). The proposed method is applicable for understudied analytes with recoveries more than 95% and relative standard deviation < 4.2%, especially for real sample analysis.

Keywords: Silica gel; 2-((3silylpropylimino) methyl)-2-hydroxy-1-naphthol (SPIMHN); Atomic absorption spectrometry; Solid phase extraction; Trace metal enrichment

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