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Ligandless switchable solvent based liquid phase microextraction of nickel from food and cigarette samples prior to its micro-sampling flame atomic absorption spectrometric determination

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Abstract

Switchable solvents represent a new solvent the use of which is in line of consideration of Green chemistry. In this work, a novel, green, ligandless switchable solvent based liquid phase microextraction method (LL-SHS-LPME) for preconcentration and determination of nickel was developed. The reversible change of hydrophilicity of 1-ethylpiperidine after exposing to CO₂ was the key property allowed simple and effective extraction process. The factors influencing the extraction procedure, including pH, type and volume of switchable solvent volume, way for removing of CO₂, vortexing time, sample volume and matrix effect were studied. The accuracy of the developed method was evaluated by the analysis of the certified reference materials and addition-recovery test. The developed extraction method was successfully applied for determination of nickel in food and cigarette samples.

Keywords: Switchable solvent, liquid phase microextraction, 1-ethylpiperidine, nickel, flame atomic absorption spectrometry, food, cigarette.

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