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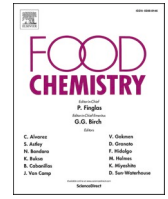

Ionic hydrophobic deep eutectic solvents in developing air-assisted liquid-phase microextraction based on experimental design: Application to flame atomic absorption spectrometry determination of cobalt in liquid and solid samples

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ABSTRACT

This paper reports a new and simple microextraction procedure for cobalt determination using green ionic hydrophobic deep eutectic solvent in developing air-assisted liquid-phase microextraction and flame atomic absorption spectrometry. The complexation of Co(II) ions was carried out by using dithizone solution as complexing agent at pH 5. The key variables affecting microextraction steps were optimized by response surface methodology (RSM) based on central composite design. Under the optimum microextraction conditions, calibration graph was linear in the range of 0.1–500 μg L^{-1} Co(II) with correlation coefficient of 0.9985. Additionally, detection limit, quantitation limit and enrichment factor were found to be 0.04 μg L^{-1}, 0.1 μg L^{-1} and 175, respectively. The reproducibility and repeatability were $\leq$ 2.9% and $\leq$ 3.6%, respectively. Based on the results obtained, the proposed methodology has been successfully employed for Co analysis in liquid and solid samples with recovery range of 94.2–105%.