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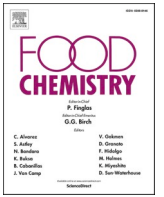

Analytical Methods

A simple and green ultrasound liquid–liquid microextraction method based on low viscous hydrophobic deep eutectic solvent for the preconcentration and separation of selenium in water and food samples prior to HG-AAS detection

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ABSTRACT

A simple and green ultrasound liquid-liquid microextraction method based on low viscous hydrophobic deep eutectic solvent (ULLME-LV-HDES) was proposed for the preconcentration and separation of selenium prior to HG-AAS detection. Six different DESs were prepared for the extraction of selenium. Quercetin was used complexing agent for Se(IV) ions. Various analytical parameters such as pH, quercetin amount, DES type and its volume, sonication time, sample volume were optimized. Tolerance limits of anion, cation and transition metal ions were studied. Preconcentration and enhancement factor were found 62.5 and 121. Under the optimum conditions, limit of detection was found 0.25 ng L^{-1} with calibration range of 0.8–120 ng L^{-1}. Relative standard deviation was found 3.2%. The accuracy of the method was confirmed with certified reference materials (NIST 1567a Wheat flour and NIST 1548a Typical diet). Finally, the developed method was successfully applied to food and water samples.