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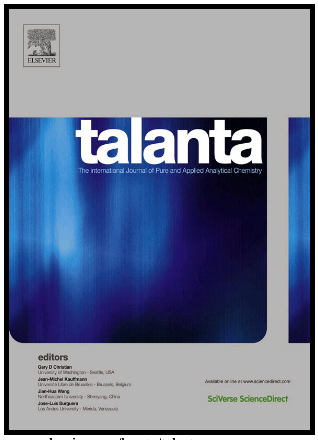

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ABSTRACT

In the present study a new centrifuge-less dispersive liquid-liquid microextraction technique based on application of a new task specific magnetic polymeric ionic liquid (TSMPIL) as a chelating and extraction solvent for selective preconcentration of trace amounts of potassium from oil samples is developed, for the first time. After extraction, the fine droplets of TSMPIL were transferred into an eppendorf tube and diluted to 500 µL using distilled water. Then, the enriched analyte was determined by flame atomic emission spectroscopy (FAES). Several important factors affecting both the complexation and extraction efficiency including extraction time, rate of vortex agitator, amount of carbonyl iron powder, pH of sample solution, volume of ionic liquid as well as effects of interfering species were investigated and optimized. Under the optimal conditions, the limits of detection (LOD) and quantification (LOQ) were 0.5 and 1.6 µg L^{-1} respectively with the preconcentration factor of 128. The precision (RSD %) for seven replicate determinations at 10 µg L^{-1} of potassium was better than 3.9%. The relative recoveries for the spiked samples were in the acceptable range of 95–104%. The results demonstrated that no remarkable interferences are created by other various ions in the determination of potassium, so that the tolerance limits (W_{Ion}/W_K) of major cations and anions were in the range of 2500–10000. The purposed method was successfully applied for the analysis of potassium in some oil samples.