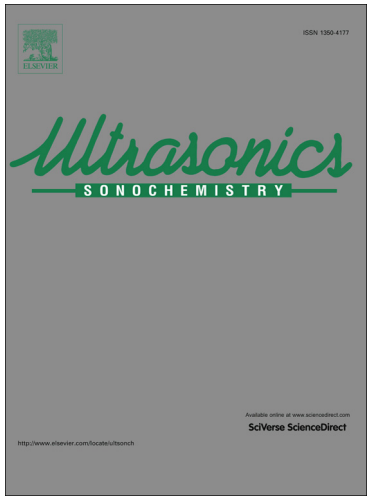

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Synthesis and application of magnetic deep eutectic solvents: novel solvents for ultrasound assisted liquid-liquid microextraction of thiophene

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ABSTRACT

Two novel magnetic deep eutectic solvents (MDESs), comprised of cheap and simple components named [choline chloride/phenol] [$FeCl_4$] and [choline chloride/ethylene glycol] [$FeCl_4$] were prepared and characterized by CHN elemental analysis, proton nuclear magnetic resonance (^{1}HNMR), vibrating sample magnetometery (VSM), Raman, Fourier transform-infrared (FT-IR) and UV-Vis spectrometery. The extraction efficiency of the prepared MDESs has been investigated in ultrasound assisted liquid-liquid microextraction based MDES (UALLME-MDES). Briefly, MDESs were added to n-heptan containing thiophene. Then, MDESs were dispersed in n-heptane by sonication. After that, microdroplets of MDESs were collected by a magnet and the remained concentration of thiophene in n-heptane phase was analyzed by GC-FID. The results indicated that [choline chloride/phenol] [$FeCl_4$] has higher extraction efficiency than [choline chloride/ethylene glycol] [$FeCl_4$]. This work opens a new way to the application of MDESs.

Keywords: GC-FID; Magnetic deep eutectic solvents; Thiophene; Ultrasound assisted liquid-liquid microextraction.