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DETERMINATION OF Pb USING Fe_3O_4@GO JOIN TO DPTH FOR FERROFLUID BASED DISPERSIVE SOLID PHASE EXTRACTION.

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In this work has been described a green and rapid method the synthesis of Fe_3O_4@GO nanospheres via chemical covalent bonding method. The Fe_3O_4@GO DPTH was applied to ferrofluid based dispersive solid phase extraction of lead as a model analyte using an ionic liquid carrier. The ferro fluid allows the rapid extraction of lead ions using a low amount of sorbent material. Besides, the magnetic separation greatly improved the separation rate. The presented method is highly time saving due to the high dispersion of the sorbent in the aqueous phase and also there is no need to shake the sample solution.

The other benefits of the proposed methods are simplicity of operation, low cost, high sorption capacity, high recovery and high preconcentration.

In order to optimize the method the following parameters were studied: sample solution pH, concentration of DPTH, extraction time, amount of sorbent, desorption conditions, influence of ionic strength, and tolerance of potentially interfering ions.

The sample or standard solution containing Pb(II), DPTH (0.05% ethanol w/v), NaCl (0.5 %, w/v) and buffer (pH = 5.6) was poured into high volume. Then 240 µL of ferrofluid was injected rapidly into the sample solution through a syringe. Thereupon, a dark cloudy suspension was formed, ferrofluid was dispersed thoroughly in solution and the complex of Pb-DPTH was extracted in a few seconds. Subsequently, a strong magnet was placed at the bottom of the tube to let the extractant settle. After about 3 min, the solution became clear and the supernatant was discarded simply by decanting it. Afterwards, the magnet was removed and 1 mL of nitric acid (2.0 mol L^{-1}) was introduced to the vial to desorb the Pb by sonication. Finally, the sorbent was separated by positioning the magnet to the outside of the tube and the concentration of Pb in acidic aqueous phase was determined by ETAAS.

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