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## Selective Separation and Determination of Lead Based on Silica Gel Developed by Surface Adsorbed New Hydrophobic Ionic Liquid

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### Abstract

A commercial silica gel modified surface with newly synthesized hydrophobic ionic liquid (SG-1,10-PhenanNTf2) was developed for a selective separation of lead, Pb(II), prior to its determination by use of inductively coupled plasma-optical emission spectrometry. The effect of pH on the selectivity of SG-1,10-PhenanNTf2 towards Pb(II) was investigated at different pH values (1.09,0). In addition, other parameters influencing the maximum uptake of Pb(II) on the newly modified phase were studied. The results showed that the adsorption capacity for Pb(II) was improved by 87.05% with the SG-1,10-PhenanNTf2 phase as compared to the activated silica gel. Adsorption isotherm data demonstrated that the adsorption process was mainly monolayer, confirming the validity of Langmuir adsorption isotherm model. Results of kinetic models suggested that the adsorption of Pb(II) on the SG-1,10-PhenanNTf2 phase obeyed a pseudo second-order kinetic model. In addition, the efficiency of this methodology was supported by applying it to real water samples with reasonable results.

### Keywords

**Author Keywords:** 1; 10-PhenanNTf2; adsorption; batch method; ICP-OES; Pb(II); silica gel

**KeyWords Plus:** ATOMIC-ABSORPTION-SPECTROMETRY; SOLVENT-EXTRACTION; METAL-IONS; CARBON NANOTUBES; SCHIFFS BASES; WATER SAMPLES; PRECONCENTRATION; ADSORPTION; SYSTEM; PHASE

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