



## Iron removal from synthetic aqueous solution using amino functionalized commercial silica gel as adsorbent

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The amino group (-NH<sub>2</sub>) is one of the most important functional group of ligands. Particularly, 3-aminopropyl-trimethoxysilane (APTMS) has relatively high affinity to bind various metal ions. The present study was aimed to modify commercial silica gel (CSG) with the APTMS via silanization process to acquire amino groups (CSG-NH<sub>2</sub>) as an adsorbent for the removal of iron from synthetic aqueous solution. For an optimal adsorption study, the effect of initial concentration of Fe(II) (1-80 mg/L), pH of solution (pH 1-10), contact time (1-36 hours) and temperature (30-60°C) were investigated. From the results, the adsorption capacity of the obtained CSG-NH<sub>2</sub> for the Fe(II) was 60.80 mg/g at pH 4, and complete adsorption equilibrium was reached within 24 hrs. The adsorption isotherm of the CSG-NH<sub>2</sub> for Fe(II) was well fitted by the Langmuir isotherm. In addition, thermodynamic data demonstrated that Fe(II) adsorption onto the CSG-NH<sub>2</sub> surface was mainly an exothermic spontaneous reaction. It is implied that CSG-NH<sub>2</sub> can be used as a high potential adsorbent for removal of ferrous ion from contaminated wastewater.

**Keywords:** Amino functionalized commercial silica gel; Iron removal; Adsorbent