



## Removal of lead (II) ions from aqueous solution by using crosslinked chitosan-clay beads

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### ABSTRACT

A simple and effective biodegradable material known as chitosan-clay composite beads were prepared to remove Pb(II) ions from aqueous solution. For this purpose, various important parameters such as contact time, pH and temperature were examined on the adsorption of Pb(II) ions onto crosslinked chitosan-clay composite beads. Maximum adsorption capacity of Pb(II) was observed at pH 4.5 and 25°C and calculated as 793 mg/g according to Langmuir isotherm model. Thermodynamic parameters namely  $\Delta G^\circ$ ,  $\Delta H^\circ$  and  $\Delta S^\circ$  of the Pb(II) adsorption process have been calculated as 7.889 kJ/mol, -15.131 kJ/mol and -0.0785 kJ/molK respectively. EDTA was the best eluent for the desorption of Pb(II) ions from the crosslinked chitosan-clay beads. Scanning electron microscope (SEM) was used to characterize the surface morphology of the crosslinked chitosan-clay beads.

*Keywords:* Adsorption; Chitosan-clay composite beads; Atomic absorption spectrophotometer; Heavy metal; Pb removal; Langmuir isotherm

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