

## Synthesis of chitosan–iron keplerate composite as an adsorbent for removal of toxic ions from water

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### ABSTRACT

New composite: chitosan-iron keplerate (CHIK) as an adsorbent was prepared by the stirring of chitosan and iron keplerate at 40°C in acidic medium. This compound beside the free chitosan and iron keplerate were characterized using Fourier transform infrared spectroscopy (FTIR) and scanning electron microscopy techniques. Chitosan film (CH), iron keplerate (IK) and CHIK composite were used as adsorbents for the removal of Cu(II) and Cd(II) ions from water following the batch equilibrium method at pH = 5.5 (adsorption studies were performed with respect to contact time and adsorbent mass). The adsorption of metal ion on the surface of compounds was carried out by the aid of atomic absorption spectrophotometer. The adsorption studies displayed that the adsorption capacity of the free chitosan or free iron keplerate was enhanced upon the composition. The isothermal behavior together with the adsorption kinetics of metal ions on CHIK composite as a function of the temperature and the initial mass of CHIK were also studied. The two well-known isotherm models (Langmuir and Freundlich equations) were applied to fit the experimental data. The results show that the experimental data of the metal ion adsorption correlates well with the Langmuir isotherm equation.

*Keywords:* Chitosan; Iron Keplerate; Adsorption studies

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