

## Low-Cost Adsorbent for water and wastewater treatment

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Heavy metals in water constituted due to rapid industrialization of societies have caused a great severe health hazards. The awful impacts are mainly due to the toxicity, high solubility, non-degradability and bio-accumulation abilities of heavy metals in water. Nowadays, removal of these destructive factors from water is a significant challenge. Numerous advanced techniques including chemical precipitation, reverse osmosis, ion exchange and solvent extraction do not seem to be economically feasible. Fortunately, adsorption was distinguished as an attractive process which was extensively used in the last few years. The dominant advantages of this process contain its efficiency, economic aspects, and the ease.

The main purpose of this research was aimed to assess the performance of Hydroxyapatite (HAP), extracted from bovine femur as a sorbent in removing Cu ions from aqueous solutions. It is a naturally occurring mineral form of calcium apatite which can be found in teeth and bones. HAP can be produced synthetically, which is costly or derived naturally.

Thermal decomposition has been applied to extract the natural HAP. The removal efficiency of the adsorption was investigated as a function of pH, contact time, initial concentration of Cu, agitation speed and adsorbent dose. The maximum adsorption capacity was 80.7 mg/g. The results showed that the removal efficiency of Cu by HAP extracted from bovine femur could be reached in a high degree (97.61%), when the initial Cu concentration was 50 mg/L, the adsorbent dosage 2.5 g/L, pH 5 and the agitation speed 200 rpm. The kinetic results of adsorption obeyed a Lagergren model. Adsorption fitted the Freundlich isotherm. The HAP extracted from the treated bovine femur was significantly used as a natural and highly cost-effective sorbent for the removal of Cu from aqueous solution.

### Biography

Hasti Hasheminejad has completed his Ph.D. in Environmental Engineering at the age of 29 in 2009, from Shiraz University, Shiraz, Iran. Since 2009, she has been the academic member of Civil & Environmental Engineering faculty at Isfahan University of Technology (Isfahan, Iran), where she is now an assistant professor. She has succeeded to register two patents during these three years. One of them was in water and wastewater treatment Science and another in Air pollution control devices. She has published more than seventeen papers in journals and conference proceedings.

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