



Adsorptive removal of Pb(II) metal from aqueous medium using biogenically synthesized and magnetically recoverable core-shell structured AM@Cu/Fe₃O₄ nano composite

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ABSTRACT

Herein, we have reported an eco-friendly and facile scheme for the synthesis of copper nano particles supported iron oxide magnetic nano particles (Cu/Fe₃O₄ MNPs) using the extract of *Aegle marmelos* (AM) leaves as a reducing and capping agent. The synthesized material (AM@Cu/Fe₃O₄ nano composite) was characterized by various techniques. The results showed that AM@Cu/Fe₃O₄ MNP had good specific surface area (27.36 m²/g) and agglomerated spherical in shape with the size range 16–20 nm. The magnetic properties of AM@Cu/Fe₃O₄ MNPs sample clearly showed ferromagnetic nature with a saturation magnetization (Ms) of 25.2 emu/g. Besides, AM@Cu/Fe₃O₄ magnetic nano composite was applied for the removal of Pb (II) from aqueous medium. The adsorption process was studied at contact time, pH and various concentrations. The adsorption data was fitted using Freundlich and Langmuir models. The kinetic results showed that adsorption was followed the pseudo-second-order kinetic model.

Keywords: Nano composite; Leaves extract; Biogenic; Toxic metal; Adsorption

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