

Pb and NI Removal from Aqueous Environment by Green Synthesized Iron Nanoparticles Using Fruit Cucumis Melo and Leaves of Ficus Virens

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Abstract : Keeping in view the serious entanglement of heavy metals (Pb⁺² and Ni⁺²) ions in an aqueous environment, a rapid search for efficient adsorbents for the adsorption of heavy metals has become highly desirable. In this quest, green synthesized Fe np's have gathered attention because of their excellent adsorption capability of heavy metals from aqueous solution. This research report aims at the fabrication of Fe np's using the fruit Cucumis melo and leaves of Ficus virens via a biogenic synthesis route. Further, synthesized CM-Fe-np's and FV-Fe-np's have been tested as potential bio-adsorbents for the removal of Pb⁺² and Ni⁺² by carrying out adsorption batch experiments. The influence of myriad parameters like initial concentration of Pb/Ni (5,10,15,20,25 mg/L), contact time (10 to 200 min.), adsorbent dosage (0.5, 0.10, 0.15 mg/L), shaking speed (120 to 350 rpm) and pH value (6,7,8,9) has been investigated. The maximum removal with CM-Fe-np's and FV-Fe-np's has been achieved at pH 7, metal conc. 5 mg/L, dosage 0.9 g/L, shaking speed 200 rpm and reaction contact time 200 min during the adsorption experiment. The results obtained are found to be in accordance with Freundlich and Langmuir's adsorption models; consequently, they could be highly applicable to the wastewater treatment plant.

Keywords : adsorption, biogenic synthesis, nanoparticles, nickel, lead

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