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Cu (II) binded chitosan/Fe₃O₄ nanocomomposite as a new biosorbent for efficient and selective removal of phosphate

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Abstract

The aim of this study was to develop a chitosan-based magnetic adsorbent for selective and effective removal of phosphate from aqueous solutions. For this purpose, Cu–chitosan/Fe₃O₄ nanocomposite was prepared using a facile method and characterized. The prepared adsorbent exhibited more porous surface with higher specific area compared to neat chitosan based on SEM and BET studies. The FTIR and EDX studies indicated the presence of Cu(II) bonded to the adsorbent surface. Crystalline properties of the adsorbent were also studied using XRD. Experimental isotherm data were fitted to nonlinear forms of Langmuir and Freunlich models. The maximum capacity for the modified adsorbent was calculated to be 88 mg P₂O₅/g, much higher than that for neat chitosan and chitosan/Fe₃O₄ according to the Langmuir isotherm. The adsorption

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