عنوان مقاله:

Synthesis and characterization of amino-functionalized magnetic nanocomposite (Fe3O4–NH2) for fluoride removal from aqueous solution

نویسندگان:

Razieh Sheikhi - *Department of Environmental Health Engineering, Tehran University of Medical Sciences, Tehran, Iran*

Abbas Norouzian Baghani - *Center for Water Quality Research (CWQR), Institute for Environmental Research (IER), Tehran University of Medical Sciences, Tehran, Iran*

Mohammad Sadegh Moghaddasian - *Department of Environmental Health Engineering, Tehran University of Medical Sciences, Tehran, Iran*

خلاصه مقاله:

Paramagnetic nanoparticles (Fe3O4-NH2) were prepared by simply treating the Fe3O4 nanoparticles with 1, 6-hexanediamine at 198.8 °C and the defluoridation ability of the resulted nanoparticles (Fe3O4-NH2) was evaluated. The synthesized sorbent was verified by SEM, TEM, XRD, and VSM. Besides, various factors, such as pH, contact time, temperature, initial concentration, and sorbent dosage that influenced the efficiency of fluoride ions removal were evaluated. The equilibrium data were studied using Langmuir and Freundlich isotherms. The best interpretation for the adsorption of fluoride ions was found to follow the Langmuir isotherm and the maximum adsorption capacity was 52.91 mg g–1 at pH=2 and 313 °K. In addition, the adsorptive properties of Fe3O4-NH2 were extremely pH dependent. Adsorption of fluoride ions attained equilibrium within 30 min and the best sorbent dose was observed to be 0.4 g/L. The maximum fluoride removal was found to be 76.8% at the best conditions. Finally, the adsorption mechanism studies revealed that the adsorption of fluoride ions on Fe3O4-NH2 could be related to electrostatic attraction.

کلمات کلیدی:

Adsorption, Amino-functionalized magnetic nanocomposite, Fluoride removal

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