Unusual efficiency of ultrafine superparamagnetic iron oxide nanoparticles for removing of arsenate ions from aqueous environment

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Arsenate, presented at aqueous source, show high risk for human life and health. For the purpose of their removing, various technologies were discovered; one of them uses a wide offer of suitable sorption materials. Iron oxide nanoparticles as sorbents are plentifully used due their high surface area and possibility of manipulation with them using of external magnetic field [1, 2]. Economy unde manding and relatively simple method to preparation of ultrafine iron oxide nanoparticles with narrow size distribution and mesoporous character was used [3]. Prepared nanoparticles were utilized for arsenate removing from aqueous environment.

Completely removing of arsenate was achieved at rati o Fe/As oncoming to 20/1 and at pH in the range of 5 to 7.6. Arsenates were totally removed with above mentioned conditions during a few first minutes of experiment. This arrangement showed the highest Freundlich absorption coefficient and balanced sorption capacity at these reaction conditions.

With respect to simple and low-cost preparation of this sorbent, high yield on reaction, almost monodispersed character, superparamagnetic behavior at room temperature and st rong magnetic response using small magnetic fields, these prepared nanoparticles of iron oxide could be considered like a good candidate for removing of undesirable toxic pollutants from different aqueous systems[4, 5].

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