

Coating Fe₃O₄ Magnetic Nanoparticles with oleic acid for High Efficient Removal of Lead Metal in Water

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Water filtration from toxic elements such as lead through Nano friendly environmentally method at low cost. The use of magnetic nanoparticles coated with oleic acid as adsorbents in water diluted lead provides approach for separating and removing the contaminants by applying external magnetic fields. 1.99 g (0.01 mol) FeCl₂·4H₂O, 5.41 g (0.02 mol) FeCl₃·6H₂O was dissolved in 50 mL distilled water. Ammonium hydroxide mixed with sodium oleate was added slowly at a rate of one drop per second to raise the pH to 9.5. Nitrogen gas could be used in a closed system to overcome the oxygen oxidation of magnetic nanoparticles and to reduce the particle size in comparison to protocols without oxygen removal. Then, the precipitate Fe₃O₄ nanoparticles were washed by repeated cycles of centrifugation and redispersion in distilled water. Then, the final products were dried in a vacuum oven at room temperature for 24 h, and the Fe₃O₄ nanoparticles were finally obtained. 1% of nanoparticles incubated with water diluted lead (15mg/L) in Rotating Incubator at 25°C For 24 hours, magnetic nanoparticles will be removed by applying external magnetic fields, the Lead concentration was measured by Royal Scientific Society of Jordan. Coating Fe₃O₄ Magnetic Nanoparticles removed 100% of lead from contaminated water. Magnetic nanoparticles were powerful tools to remove heavy metal from drinking water with high effectiveness and low significant toxicity. magnetic nanoparticles are therefore appropriate for the removal of numerous heavy metals like Lead. Compared to other disinfection technologies, magnetic nanoparticles disinfection is cost-effective and easy to operate, with bright future for its engineering application.