

عنوان مقاله:

Fabrication and Characterization of the Green Synthesized Magnetic Chitosan-zinc Nanocomposites: A Reusable and Effective Multifunctional Nanocatalyst for the Reduction of Organic Pollutants

محل انتشار:

مجله تحقیقات شیمی تجزیه و تجزیه زیستی، دوره 8، شماره 3 (سال: 1400)

تعداد صفحات اصل مقاله: 19

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خلاصه مقاله:

Bimetallic nanoparticles have numerous applications in different areas, including catalysis, medicine, optics, and so on. Due to numerous intrinsic disadvantages and potentially toxic chemical procedures, finding nontoxic, green, cost-effective, and eco-friendly approaches for the production of bimetallic nanoparticles is much desired. In this study, Zn NPs, Zn/Fe³O₄ NPs, and Zn/Chitosan/Fe³O₄ nanocomposites were synthesized via a one-pot procedure by using leave extract of *Quercus brantii*, in the absence of any dangerous components. The catalytic capacity of the green synthesized Zn/Chitosan/Fe³O₄ nanocomposite was considered for the degradation of environmental pollutants, including Congo red (CR), Methylene blue (MB), Cr(VI), and 4-nitrophenol (4-NP). The Zn/Chitosan/Fe³O₄ nanocomposites have been morphologically characterized using UV-Vis, SEM, and EDX studies. The antioxidant reducing and antibacterial activities of Zn/Chitosan/Fe³O₄ nanocomposites have been considered. Our results showed that this nanocomposite could be reused five times for removal of Congo red (CR), Methylene blue (MB), Cr(VI), and four times for reduction of 4-nitrophenol (4-NP), without substantial reduction in the catalytic capacity. Results showed the high potential catalytic activity of Zn/Chitosan/Fe³O₄ nanocomposite for the reduction of organic pollutants.

کلمات کلیدی:

Magnetic Chitosan, Bimetallic nanoparticles, Zn/Chitosan/Fe³O₄ nanocomposite, Catalytic reduction, 4-Nitrophenol, Congo red

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