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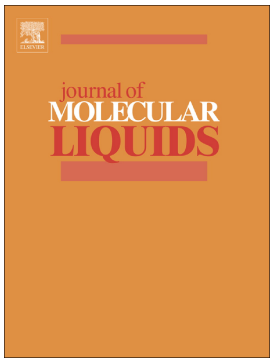

Development of maghemite nanoparticles supported on cross-linked chitosan (γ-Fe2O3@CS) as a recoverable mesoporous magnetic composite for effective heavy metals removal

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Development of maghemite nanoparticles supported on cross-linked chitosan (γ-Fe_2O_3@CS) as a recoverable mesoporous magnetic composite for effective heavy metals removal

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Abstract

A mesoporous magnetic composite, γ-Fe_2O_3-functionalized cross-linked chitosan (γ-Fe_2O_3@CS), was developed as an efficient adsorbent to remove cadmium (Cd^{2+}) ions from contaminated water media. The as-prepared composite was characterized by FESEM, TEM, EDX, VSM, BET and XRD techniques. Several parameters affecting the degradation efficiency including surface area, solution pH, contact time, adsorbent dose, initial Cd^{2+} concentration and temperature were evaluated and discussed. The average crystallite size of γ-Fe_2O_3 was found to be 26.5 nm. The highest magnetization saturation of adsorbent was 25.1 emu/g. The adsorption rate belonged γ-Fe_2O_3@CS composite was much higher than that γ-Fe_2O_3 and CS, which reflects a synergistic effect between the maghemite and CS particles on the removal of Cd^{2+}. Based on the adsorption

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