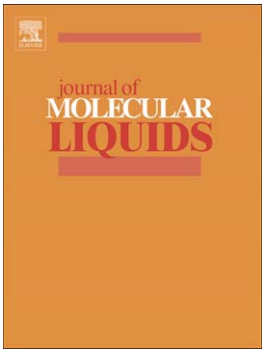

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High-Efficient Scavenging of U(VI) by Magnetic Fe_3O_4@Gelatin Composite

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Abstract. In the present study, the surfaces of Fe_3O_4 nanoparticles were modified by gelatin coating to prepare a magnetic Fe_3O_4@gelatin composite. The FTIR and zeta potential analysis provided evidence for the successful grafting of gelatin molecules on Fe_3O_4 surfaces. The Fe_3O_4@gelatin samples were stable in solution and could be easily separated from the aqueous solution by exposing to an external magnetic field. Batch technique was adopted to evaluate the efficiency of Fe_3O_4@gelatin composite for scavenging U(VI) under a series of environmental conditions. The sorption reached equilibrium within 5 h and the kinetic data were well simulated by the pseudo-second-order model, indicating that the decontamination of U(VI) by Fe_3O_4@gelatin was a chemisorption process. The ionic strength-independent sorption behaviors suggested that inner-sphere complexation was the dominant uptake mechanism of U(VI). The maximum sorption amount of U(VI) on Fe_3O_4@gelatin composite at 293 K (herein, 2.74×10^{-4} mol/g) is considerably higher than a series of