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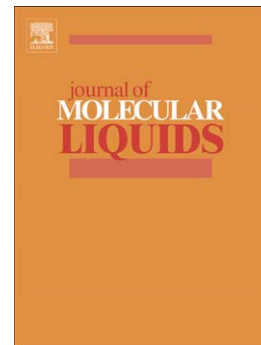
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High-Efficient Scavenging of U(VI) by Magnetic Fe₃O₄@Gelatin Composite

Pengfei Tang¹, Jian Shen¹, Zhendong Hu¹, Guangli Bai¹, Mao Wang¹, Benjun Peng^{2*}, Runpu Shen³, Wensheng Linghu^{3*}

1. Jiangsu Xinhuai River Pharmtech Co. Ltd., Jiangsu 223001, P. R. China

2. Huaibei Normal University, Jiangsu 235000, P. R. China

3. College of Chemistry and Chemical Engineering, Shaoxing University, Zhejiang 312000, P. R. China

*Corresponding authors. Email: benjunpeng@sina.cn (B. Peng); wslinghu@usx.edu.cn (W. Linghu).

Abstract. In the present study, the surfaces of Fe₃O₄ nanoparticles were modified by gelatin coating to prepare a magnetic Fe₃O₄@gelatin composite. The FTIR and zeta potential analysis provided evidence for the successful grafting of gelatin molecules on Fe₃O₄ surfaces. The Fe₃O₄@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 Fe₃O₄@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 Fe₃O₄@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 Fe₃O₄@gelatin composite at 293 K (herein, 2.74×10⁻⁴ mol/g) is considerably higher than a series of

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