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Sodium alginate/polyethyleneimine hydrogel: an effective material for the adsorption of heavy metal ions in water and catalysis

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Abstract

Water pollution created by heavy metal ions becomes worldwide concern because of indiscriminate disposal of industrial wastewater in pure water system. In this work, we report a natural and highly efficient sodium alginate (ALG)/polyethyleneimine (PEI) composite hydrogel fabricated by a chemical crosslinking method for the removal of heavy metal ions from wastewater. The adsorption of heavy metal ions was thoroughly investigated in single ion adsorption and multi ions adsorption systems. In addition, after the adsorption we in situ reduced the Cu+2 ions forming a Cu NPs-loaded hydrogel, which proved an excellent catalyst as evidenced by the reduction reaction of 4- nitrophenol. We believe that the as-prepared ALG/PEI hydrogel will present an effective and practical paradigm for the cascaded treatment and recycling of heavy metal ions in wastewater.

Biography

I am an organic and materials chemist working at the development of new materials with a strong passion for materials research. My interests lie in the design and preparation of novel materials for the applications in adsorption, and catalysis. My background and my interdisciplinary training in the fields of natural products chemistry, polymer chemistry, and nanomaterials assist me in the characterization of these highly potent materials and allow me to study their potential applications in biomedical engineering and environmental science. I have completed my PhD from University of Camerino, Italy and postdoctoral study from Southeast University, China.

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