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Water treatment using magnetic new types of modified grafted chitosan (CMCH-g-PAA)-Fe₃O₄ nanoparticles composite

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The need for a sustainable, affordable supply of clean water is a key priority for our nation's future. There is an urgent need to develop innovative and novel materials and methods for water treatment, which will be reflected in maintaining public health and environmental quality.

In this study, the modified natural chitosan as an efficient flocculants will be grafted by vinyl monomer, and acrylamide by chemical methods in aqueous acid solutions. The graft copolymer obtained was characterized using Fourier transform infrared spectroscopy, scanning electron microscopy, X-ray diffraction and thermogravimetric analysis. Effects of initiator concentration and monomer concentration on the grafting percentage were investigated.

Flocculation experiments using the prepared graft copolymer, chitosan, and their blends with inorganic and synthetic polymer flocculants such as polyacrylamide (PAM) was performed. The factors affecting flocculants efficiency including molecular weight, grafting percentages, blend ratios, dose of flocculant, temperature, pH and ionic strength were also studied.

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