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Removal of bisphenol A *via* novel 3D g-C_3N_4/HEC hydrogel photocatalysts: Adsorption and photocatalytic degradation

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A series of novel g-C_3N_4/HEC hydrogel photocatalysts with three-dimension (3D) network structure have been synthesized *via* a simple one-pot reaction, using hydroxyethyl cellulose (HEC) and graphic carbon nitride (g-C_3N_4) nanoparticles as raw materials. The characteristics of g-C_3N_4/HEC hydrogels are investigated by X-ray diffraction (XRD), scanning electron microscopy (SEM) and energy dispersive spectrometer (EDS). The optical performances of g-C_3N_4/HEC hydrogels are investigated by UV-vis diffuse reflection spectrum (DRS) and photoluminescence (PL). Scanning electron microscopic results reveal that the hydrogels are polyporous and g-C_3N_4 nanoparticles are uniformly distributed into HEC hydrogel network. Photoluminescence results show that HEC hydrogel network is conducive to seperation of photogenerated electron-hole pairs. The hydrogels show high efficient removal ability of bisphenol A (BPA) by adsorption and photocatalytic degradation. Among the different g-C_3N_4 compositions, addition of 50% g-C_3N_4 showed optimized adsorption and photocatalytic degradation of BPA, which are 9.88 mg•g^{-1} and 80% within 120 min. Moreover, the g-C_3N_4/HEC hydrogels showed higher efficient removal performance of TOC. Due to synergistic effect of adsorption and photocatalytic degradation, g-C_3N_4/HEC hydrogels are able to mineralize BPA continuously and efficiently. In addition, the g-C_3N_4/HEC hydrogels can be reduplicated used without complex desorption processes.

Biography

Xian Ruan has completed her bachelor's degree in chemistry from South China University of Technology and carry out a successive academic project that involves postgraduateand doctoral study in enviromental engineering at the same university.

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