

Preparation of Fe, Cr Codoped TiO₂ Nanostructure for Phenol Removal from Wastewaters

Authors : N. Nowzari-Dalini, S. Sabbaghi

Abstract : Phenol is a hazardous material found in many industrial wastewaters. Photocatalytic degradation and furthermore catalyst doping are promising techniques in purpose of effective phenol removal, which have been studied comprehensively in this decade. In this study, Fe, Cr codoped TiO₂ were prepared by sol-gel method, and its photocatalytic activity was investigated through degradation of phenol under visible light. The catalyst was characterized by XRD, SEM, FT-IR, BET, and EDX. The results showed that nanoparticles possess anatase phase, and the average size of nanoparticles was about 21 nm. Also, photocatalyst has significant surface area. Effect of experimental parameters such as pH, irradiation time, pollutant concentration, and catalyst concentration were investigated by using Design-Expert[®] software. 98% of phenol degradation was achieved after 6h of irradiation.

Keywords : doping, metals, sol-gel, titanium dioxide, wastewater

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