عنوان مقاله:

Synthesis and characterization of Fe,S-codoped TiO2/SiO2 nanoparticles and their use in effective photocatalytic degradation of toxic dyes under purpule LED illumination

محل انتشار:

اولین کنگره بین المللی شیمی و نانو شیمی از پژوهش تا فناوری (سال: 1397)

تعداد صفحات اصل مقاله: 6

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خلاصه مقاله:

Reactive and Azo dyes are the main pollutants of surface water. Contamination due to these dyes poses a serious public health concern, as they can be toxic, carcinogenic and mutagenic. In this research, a novel method for the destruction of toxic dyes from aqueous samples has been proposed using nanoparticles of TiO2. To overcome the limitations of TiO 2, it is doped with S and Fe. Moreover, it is coupled with SiO2 to increase the surface area for photocatalytic activity improvement. The samples were characterized by XRD, FE-SEM, EDX, FT-IR, DRS, PL analysis. It was determined that all the samples prepared were in anatase phase and the absorption wavelength is transmitted from the ultraviolet to the visible region in the presence of the doping species and the dopant prevents the growth of nanoparticles. The photocatalytic activity was evaluated by photocatalytic oxidation of congo red (as a model of dye -polluted wastewaters) solutions under the sunlight and visible irradiation. Experimental condition including pH, dye concentration, photocatalyst concentration and irradiation time were optimized. Consequently, our results show Fe, S -codoped TiO2/SiO2 nanoparticles has an extraordinary photocatalytic activity to degradation of .congo red under both UV and sunlight irradiation

کلمات کلیدی:

dye degradation, congo red, nanoparticles, codeped TiO2, LED illumination