عنوان مقاله:

Application of industrial immobilized TiO2 nanoparticles for photocatalytic treatment of dye solution in rectangular photoreactor

محل انتشار:

سومین کنفرانس نانوساختارها (سال: 1388)

تعداد صفحات اصل مقاله: 5

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خلاصه مقاله:

Photocatalytic decolorization of a dye solution containing C. I. Basic Blue 3 (BB3) was studied in the presence of industrial immobilized TiO2 nanoparticles irradiated by UV-C light. The investigated photocatalyst was industrial Millennium PC-500 (crystallites mean size 5-10 nm) immobilized on non-woven paper (Ahlstrom Research & Services). SEM images and X-ray analyses of the immobilized TiO2nanoparticles showed that it could be regenerated and used for several times. All the experiments were performed in a rectangular photochemical reactor equipped with a 30 W UV lamp emitted around 254 nm. Results showed that photocatalytic decolorization efficiency was small when the photolysis was carried out in the absence of immobilized TiO2 nanoparticles and it was also negligible in the absence of UV light. The effect of BB3 concentration was also examined. Results indicated that photocatalytic decolorization efficiency decreased with increasing the initial concentration of the dye. Photocatalytic decolorization process was explained in terms of the Langmuir-Hinshelwood kinetic model. The values of the adsorption equilibrium .constant, K, and the second order kinetic rate constant, k, were 0.0797 ppm-1 and 0.4202 ppm min-1 respectively

کلمات کلیدی:

Advanced oxidation processes;Nanocatalyst, Heterogeneous photocatalysis; rectangular photoreactor