

Photocatalytic degradation of Sulfamethoxazole in water: investigation of the effect of operational parameters

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Abstract : The potential of a common semiconductor, TiO_2 , has been explored as an effective catalyst for the photodegradation of Sulfamethoxazole (SMZ) antibiotics from aqueous solution. In this laboratory study, the effects of pH (3-11), nanoparticle dose (0.02-0.16 g/L), reaction time (5-150 min), initial SMZ concentration (20-100 mg/L) and lamp power (15W) were assessed on SMZ removal efficiency in a batch photocatalytic reactor. SMZ concentration in output was measured by the HPLC at the maximum wave length of 267 nm. The optimum obtained pH and TiO_2 nanoparticle dose were 3 and 0.08 g/L respectively. In this study, at the optimum reaction time of 60 min, by increasing the concentration of SMZ the removal efficiency decreased. Under optimal conditions of concentration, the removal efficiency was 96.5%. On the basis of the obtained results, it can be concluded that TiO_2 nanoparticles photocatalytic process can efficiently remove SMZ from aqueous solutions.

Keywords : TiO_2 , Photocatalysis, UV-visible light, Sulfamethoxazole.

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