عنوان مقاله:

Photocatalytic Degradation of Cefixime Antibiotic by Polyaniline/SnO_2 Nanocomposite and Optimization of the Process Using Response Surface Methodology

محل انتشار:

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خلاصه مقاله:

Background: Aniline-based organic nanocomposites have a significant performance as photocatalysts in the advanced oxidation process (AOP).Methods: In this study, polyaniline-tin dioxide (PA/SnO۲) nanocomposite was prepared using an ultrasonic process. Next, its efficiency as a photocatalyst in the removal of Cefixime antibiotic pollutant from contaminated waters in a tubular photo reactor was investigated. The experiments were designed by the response surface methodology (RSM) via Minitab software, in such a way that the effects of various parameters on the process are investigated. The effect of different parameters such as reaction time, solution pH, flow rate, antibiotic concentration and hydrogen peroxide concentration on the removal efficiency was investigated.Results: According to the results, the following optimal conditions were obtained: time of ۱۲۰ min, pH of ۸.۶۹, hydrogen peroxide concentration of ۴.۲۲ mM, flow rate of ۱.۲۵ L/min and initial antibiotic concentration of ۲۲.۹۲ mg/L. Under the above-mentioned optimal conditions, the efficiency of Cefixime removal was more than ۷۲.۲۴%.Conclusion: The present study confirms the usability of the PA/SnO۲ nanocomposite as a novel and effective photocatalyst for photocatalytic degradation of Cefixime antibiotic in contaminated water under UV light.

کلمات کلیدی:

degradation, Cefixime antibiotic, Photocatalytic Process, Polyaniline PA/SnO۲ nanocomposite, tubular photo reactor, optimization, RSM