

عنوان مقاله:

Degradation of Benzotriazole from aqueous solutions: A synergistic effect of nano- $\text{Fe}_2\text{O}_3@ \text{Alg-TiO}_2$ on UV/ $\text{Fe}_2\text{O}_3@ \text{Alg-TiO}_2$ process

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خلاصه مقاله:

In this study, the decomposition of BTA was examined using a photocatalytic process (UV/ $\text{Fe}_2\text{O}_3@ \text{Alg-TiO}_2$). The effects of various operational parameters such as the initial pH (۳-۷-۱۰), catalyst dosage (۰.۰۵, ۰.۱, ۰.۱۵ g/L), BTA initial concentration (۱۵-۴۵ mg/L), UV intensity (۲, ۴, and ۶ watts), and detention time (۱۵, ۳۰, and ۴۵ minutes) on the decomposition of BTA in the reactor with Batch conditions and in deionized water, real wastewater (three different matrices saline water, and real raw wastewater after activated sludge and after stabilization ponds) were investigated. SEM, XRD, and FTIR determined the synthesized catalyst's specifications. The results showed that ۷۳.۵% of BTA and ۳۰% TOC was removed during the UV/ $\text{Fe}_2\text{O}_3@ \text{Alg-TiO}_2$ photocatalytic process at the optimal condition (BTA=۳۰ mg/L, pH = ۳, UV = ۴ Watt and catalyst dosage = ۰.۱۵ g/L) in deionized water. Also, the efficiency of the process in removing contaminants from the Saline, real raw sewage after activated, and after activated sludge and stabilization ponds was ۲۳%, ۴۷%, and ۵۱%, respectively. The results showed that the toxicity decreased in ۲۰۰ minutes that if sufficient time is provided to complete the reaction toxicity can be reduced. The results related to the amount of electrical energy consumed showed that considering both the advantages of BTA removal efficiency and energy consumption, the best performance was obtained in optimum conditions.

کلمات کلیدی:

Benzotriazole, cross-linked alginate polymer, Fe_2O_3 nanoparticles, Photocatalytic process, Titanium dioxide Nanoparticles

