

عنوان مقاله:

Using Experimental Design to Optimize the Photo-degradation of P-Nitro Toluene by Nano-TiO₂ in Synthetic Wastewater

محل انتشار:

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خلاصه مقاله:

In this project, the degradation of synthetic wastewater comprising p-nitro toluene (PNT) is investigated using UV/TiO₂ process. PNT as a pollutant has a very harmful effect on the environment and human hormones. TiO₂ is one of the best metal oxides it has photo catalyst role. The full factorial design (FFD) of experiment is employed to investigate the effect of working variables including pH, initial dosage of PNT and catalyst concentration. The Analysis of variance (ANOVA) presented a high determination coefficient value ($R^2 = 0.9876$, $R^2_{pred} = 0.8585$, $R^2_{adj} = 0.9596$) for degradation of PNT and acceptable prediction of second-order regression model. The graphical counter plots were used to control the optimum conditions. The operative variables are optimized at $[TiO_2] = 0.2g/L$, pH value of 4, and $[PNT] = 50mg/L$. These findings suggest that the percentages of degradation and mineralization of PNT at the forecasted optimum conditions after 120 min of reaction were 64 and 55%, respectively.

کلمات کلیدی:

UV/TiO₂ Process, degradation, p-Nitro Toluene, Mineralization, Analysis of variance

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