عنوان مقاله:

Optimization and modeling using a response surface methodology (RSM) based on the central composite design of azo dye with immobilized titania nanoparticles

محل انتشار:

هفتمین کنگره ملی مهندسی شیمی (سال: 1390)

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خلاصه مقاله:

The experimental design methodology was applied to model and optimize the operation parameters on photocatalytic degradation of Acid Red 73 using immobilized TiO_2 nanoparticles. Four experimental parameters, including pH value, initial dye concentration, H_2O_2 and anion concentration, were chosen as independent variables. The multivariate experimental design was used to establish a quadratic model as a functional relationshipbetween the degradation rate of Acid Red 73 (response) and four independent variables. Theresults show that the degradation rate of dye was significantly affected by the initial dye concentration and pH. The optimal values of the studied parameters under the related constraint conditions were found at pH 3, initial dye concentration of 25mg/L, H_2O_2 concentration of 0.5 mg/L and anion concentration of 0.69mg/L. The degradation rate of Acid Red 73 approached92.24% under optimal conditions. The regression analysis with R2 value of 0.9585 shows a satisfactory correlation between the experimental data and predicted values for the degradation of Acid Red 73.

کلمات کلیدی:

photocatalysis, immobilized TiO2, response surface methodology

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