Optimized Degradation of Eosin Dye Through UV-ZnO NPs Catalyzed Reaction

التحلل الأمثل لصبغة الأيوسين من خلال تحفيز NPs للأشعة فوق البنفسجية والزنك

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Abstract

The present study is set out to determine the photocatalytic degradation potential of ZnO nanoparticles for effective degradation of Eosin dye. The heterogeneous photocatalytic experiments were carried out by irradiating aqueous dye solutions with ultraviolet light. The influence of effective parameters like flow rate, pH, catalyst dose, and dye concentration was examined. The best degradation efficiency (66.82%) of ZnO Nanoparticles against Eosin dye was achieved within 90 min of reaction time. The Box–Behnken design under the Response Surface Methodology (RSM) was chosen as a statistical tool to obtain the correlation of influential parameters. The optimum values were recorded as follows: 0.59 g, 15.75 ppm and 136.12 ml/min for amount of catalyst, dye concentration and flow rate, respectively. The maximum percent degradation achieved at these conditions was 71.44.