

## عنوان مقاله:

Application of experimental design approach for optimization of the photocatalytic degradation of humic substances in aqueous solution using immobilized ZnO nanoparticles

## محل انتشار:

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## خلاصه مقاله:

Degradation of humic substances in water is important due to its adverse effects on the environment and human health. The aim of this study was modeling and investigating the degradation of humic substances in water using immobilized ZnO as a catalyst. ZnO nanoparticles were synthesized through simple coprecipitation (CPT) method and immobilized on glass plates. The immobilized ZnO nanocatalyst was characterized through scanning electron microscopy (SEM) and X-ray diffraction (XRD). Response surface methodology (RSM) and central composite design (CCD) were used to create an experimental design for humic degradation and color removal efficiency. The most important parameters including initial concentration, pH, and contact time were optimized. The optimum conditions were initial concentration of 7.68 mg/l, pH of 4.42, and contact time of about 125.6 minutes. Under optimal conditions, maximum humic substances and color removal of about 100 and 82.37% were obtained, respectively. These results illustrate that an immobilized form of ZnO can be used as an efficient nanocatalyst for effective degradation of humic substances in water.

## کلمات کلیدی:

Humic Substances, Catalyst, Immobilization, Zinc Oxide, Nanoparticles, Modeling

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