

عنوان مقاله:

Synthesis and Characterization of ZnO/Zein/Calcium Alginate Nanocomposite Beads as the Heterogeneous Photocatalyst for Degradation of an Azo Dye in Polluted Water

محل انتشار:

نهمین سمینار ملی شیمی و محیط زیست ایران (سال: 1398)

تعداد صفحات اصل مقاله: 1

نویسندگان:

A AZIZI - Active Pharmaceutical Ingredients Research Center, Tehran Medical Sciences, Islamic Azad University, Tehran, Iran

S Hallajian - Department of Organic Chemistry, Faculty of Pharmaceutical Chemistry, Tehran Medical Sciences, Islamic Azad University, Tehran, Iran

N Motakef-Kazemi - Department of Medical Nanotechnology, Faculty of Advanced Sciences and Technology, Tehran Medical Sciences, Islamic Azad University, Tehran, Iran

خلاصه مقاله:

Zein is a hydrophobic biopolymer widely used for its biocompatibility and biodegradability applications. Alginate is a polysaccharide broadly applied for encapsulating and surrounding materials lead to excellent mechanical properties. Zinc oxide (ZnO) nanoparticles, were applied for the photocatalytic degradation of dyes in water because of unique features. Azo dyes are known as a very significant group of water pollutants that appear in the effluents of different industries. In this study, ZnO/Zein/Calcium alginate nanocomposite beads were synthesized and, investigated for the decomposition of tartrazine dye in water pollutant. The factors affecting the degree of photocatalytic degradation, including different concentrations of dye, different quantities of catalyst and various pHs were investigated based on radiation of UV-C light. Finally, maximum photodegradation (80%) of tartrazine obtained using the prepared nanocomposites and, the photocatalysts can be used several times in the degradation process via favorable separation. The samples were characterized by field emission scanning electron microscopy (FE-SEM), energy-dispersive spectroscopy (EDS), X-ray diffraction (XRD), and Fourier transform infrared spectroscopy. ZnO nanoparticles were observed with the average particle size in the range of 25-80 nm that dispersed on the surface of zein/Ca-Alg uniformly. Irregular and mesoporous structure of zein microspheres can influence ZnO immobilization. Our results indicate that photocatalytic activity of ZnO/zein/Ca-Alg nanocomposites dependant on the mass ratio of ZnO amount loading and weight percent of substrates for the most optimal photocatalytic degradation for removal of the organic azo dye. These findings are relevant to the focus of the environmental chemistry including advanced .oxidation processes, control of environmental pollution problems, removal dyes in wastewater

کلمات کلیدی:

لینک ثابت مقاله در پایگاه سیویلیکا:

<https://civilica.com/doc/956037>



