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Isfahan University of Medical Sciences

Sol-gel autocombustion synthesis of ZnO nano-particles and its application in photo-catalytic degradation of textile dyes

A. Mohammadi[1], N. Assi[2,*], A. Naeemy[2], Q. Sadr Manuchehri[2], H. Bakhtiari[2]

[1]Department of Drug and Food Control, Faculty of Pharmacy, Tehran University of Medical Sciences, Tehran, Iran
[2]Nanotechnology Research Centre, Faculty of Pharmacy, Tehran University of Medical Sciences, Tehran, Iran

Background and Aims: Dyes are an important class of synthetic organic compounds used in the textile industry and are therefore common industrial contamination. Main pollution in wastewater came from dyeing processes. The objective of this study was the synthesis of ZnO nano particles and its application in Photocatalytic degradation of textile dyes in aqueous solution.
Methods: ZnO nano particles were synthesized by Sol-gel autocombustion method. The produced nano particles were characterized by X-ray Diffraction , Energy Dispersive analysis of X-ray, dynamic diffraction light scattering and scanning electron microscope. Finally, the effects of dye initial concentration, amount of nano particles and pH on photocatalytic degradation were investigated.
Results: In this study ZnO nano particles were prepared with an average particle size of less than 50 nm. The percent of photo degradation of textile dyes under UV- irradiation in the present of nano particles and without nano particles were 80 and 10 %, respectively.
Conclusions: This study has clearly indicated that ZnO nano particles have active photocatalytic effects on the degradation of textile dyes.

Keywords: ZnO nano particles; sol-gel autocombustion; Photo catalytic degradation