Ministry of Higher Education & Scientific Research AL-Muthanna University College of Science Chemistry Department



Hydrothermal Synthesis of ZnO / CdS Nano Composite as a Photo catalyst for removing of Textile dyes

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Abstract

In this study, ZnO-CdS nanoparticles were prepared using the Hydrothermal technique) at a temperature of 60 °C, and pH 6, the prepared samples were incinerated for one h at a temperature (500 °C). Also, (Pd doped ZnO-CdS) was prepared by photo deposition using an inert environment nitrogen gas .

The chemical and physical properties of the prepared nanocomposites were characterized using different techniques such as X-ray diffraction (XRD), transmission electron microscopy (TEM), Technique scanning electron microscope (FE-SEM), Thermal Gravimetric Analysis(TGA), and UV-visible. Results show doping Pd ions on the surface of ZnO-CdS, did not show any peaks for Pd in XRD characterization.

The UV-visible showed that the energy gap of ZnO-CdS was reduced from 3.42 eV to 2.98 eV after doping palladium nanoparticles. The photodegradation of brilliant green dye was studied using ultraviolet light under different conditions in the presence of Pd doped ZnO-CdS, studying the effect of factors such as the effect of dye concentration, The intensity of incident light,The mass of prepared nanocomposite and studying the , stability of ZnO-CdS/pd nanocomposites .It was observed that the photocatalytic degradation of BG dye were 86.6%- 95.8%

for first, to four cycles. This indicates the good stability of ZnO-CdS/pd nanocomposites and could be potentially applied in practical batch degradation.

Removal of Pollutants (Dyes) by Using ZnO-CdS\Pd nanoparticles to treat water pollution through toxic textile dyes by taking a laboratory sample of a mixture with toxic textile dyes (100 ml) for a mixture of dye pollutants which gave a photocatalytic degradation 90% under optimum condition.