Photocatalytic degradation of phenol red by using new spinel – type Co1-xCdxFe2O4 nanocomposites

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In this work involve the study of preparing the new spinel Co1-xCdxFe2O4 photocatalyst was prepare by co-precipitation method at different ratios of (X=0.8:0.2, 0.5:0.5, and 0.2:0.8) and calcinations at temperature 600°C for three hours. The prepared powder was recognize by X-ray diffraction, fourier transform technique (FT-IR), UV-visible spectroscopy, scanning electron microscopy (SEM), energy dispersive spectroscopy (EDS), atomic force microscope (AFM) and high performance liquid chromatography (HPLC). The photocatalytic activity was estimated under high pressure mercury lamp (HPML) OSRAM (125) watts for degradation phenol red C19H14O5S solution after find the wavelength at $\lambda$ max 432 nm. The conclusion showed that (0.5:0.5) percentage at 600°C has high activity than other ratio at different temperature. After this study several measure such as better of mass for the catalyst, initial of concentration for spinel Co1-XCdXFe2O4, effect of pH, effect of temperature. Studies have shown X-ray and electron microscopy studies showed the average size of the granules prepared for the composite in this manner (18.16-39.64). The electrical characteristics (L.C.R) were also studied for all spinel. Cadmium alone was an electrical insulator but by adding cobalt with iron it turned into a semiconductor of the electric current.