

Removal of Phenol from Aqueous Solutions by Ferrite Catalysts

Authors : Bayan Alqasem, Israa Othman, Mohammad Abu Haija, Fawzi Banat

Abstract : The large-scale production of wastewater containing highly toxic pollutants made it necessary to find efficient water treatment technologies. Phenolic compounds, which are known to be persistent and hazardous, are highly presented in wastewater. In this study, different ferrite catalysts CrFe_2O_4 , CuFe_2O_4 , MgFe_2O_4 , MnFe_2O_4 , NiFe_2O_4 , and ZnFe_2O_4 were employed to study the catalytic degradation of phenol aqueous solutions. The catalysts were prepared via sol-gel and co-precipitation methods. All of the prepared catalysts were characterized using infrared spectroscopy (IR), X-ray diffraction (XRD), and scanning electron microscopy (SEM). The ferrites catalytic activities were tested towards phenol degradation using high-performance liquid chromatography (HPLC). The photocatalytic properties of the ferrites were also investigated. The experimental results suggested that CuFe_2O_4 is an effective catalyst for the removal of phenol from wastewater. Additionally, different CuFe_2O_4 composites were also prepared either by varying the metal ratios or incorporating chemically reduced graphene oxide in the ferrite cluster.

Keywords : phenol degradation, ferrite catalysts, ferrite composites, photocatalysis

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