

## Removal of Phenol from Aqueous Solutions by Ferrite Catalysts

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**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  $\text{CrFe}_2\text{O}_4$ ,  $\text{CuFe}_2\text{O}_4$ ,  $\text{MgFe}_2\text{O}_4$ ,  $\text{MnFe}_2\text{O}_4$ ,  $\text{NiFe}_2\text{O}_4$ , and  $\text{ZnFe}_2\text{O}_4$  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  $\text{CuFe}_2\text{O}_4$  is an effective catalyst for the removal of phenol from wastewater. Additionally, different  $\text{CuFe}_2\text{O}_4$  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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