



Use of Some Metal Ferrites in Reduction of 4-Nitrophenol

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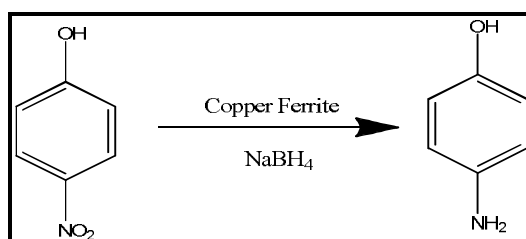
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ABSTRACT

The noble-metal nanocatalysts are commonly used, but ferrite-based magnetic catalysts are relatively less used. The magnetic copper ferrite, CuFe_2O_4 (catalyst) was synthesized via hydrothermal method and it was used to reduce 4-nitrophenol in presence of sodium borohydride. The copper ferrite was analysed by X-ray diffraction spectroscopy (XRD), Energy-dispersive X-ray spectroscopy (EDX), Scanning electron microscopy (SEM) and Fourier transform infrared (FTIR). The reduction of 4-nitrophenol was observed in presence of copper ferrite as catalyst and sodium borohydride as the reductant. The conversion of 4-nitrophenol to 4-nitroamine was monitored by UV-Visible spectrophotometer. The effect of various parameters such as pH, concentration of 4-nitrophenol, and amount of catalyst were studied. The reaction was completed in 6 min in the presence of copper ferrite. It was interesting to note that copper ferrite exhibited higher rate of reduction in presence of zinc or nickel ferrites (combined with cobalt ferrite), may due to synergetic effect.

Graphical Abstract:



Keywords: Copper ferrite, Reduction, 4-Nitrophenol, Catalyst.