



**Synthesis of Magnetic Nano Sized Cobalt Ferrite Thin Film by
Chemical Bath Deposition Method and their Photocatalytic
Application for Removal of Congo red Dye**

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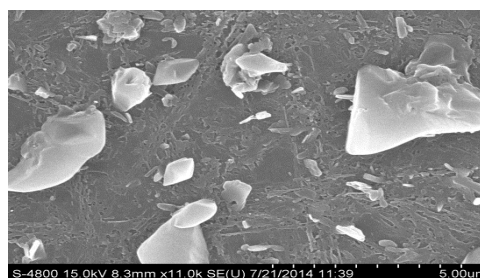
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ABSTRACT

The present investigation report is a novel method for the removal of Congo red (CR) dye from an aqueous solution. In present investigation cobalt ferrite (CoFe_2O_4) thin film was deposited on glass substrate by using chemical bath deposition method. It was successfully prepared while nanostructure of thin film was confirmed by SEM and XRD characterization method. The magnetic property of the film was confirmed by VSM (Vibrating sample magnetometer). The average crystal size calculated by Scherrer formula from XRD analysis is 28 nm. Prepared thin film was then applied for photocatalytic degradation of Congo red dye by dipping it in aqueous solution. Different parameters like contact time, different initial conc. and pH have been studied to optimize reaction condition. The optimum conditions for the removal of the dye are initial concentration 30 mg L^{-1} , contact time 120 min and pH 7.

Graphical Abstract



SEM micrograph of prepared CoFe_2O_4 thin film

Keywords: Congo red dye, cobalt ferrite, SEM and XRD, VSM.