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Structural and magnetic properties of nanocrystalline $NiFe_2O_4$ thin film prepared by spray pyrolysis technique

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The nanocrystalline $NiFe_2O_4$ thin film has been prepared using a spray pyrolysis technique on glass substrate. The prepared thin film was characterized by using X-ray diffraction (XRD), Fourier transform Infrared spectroscopy (FTIR), and Field Emission-Scanning Electron Microscopy (FE-SEM) characterization techniques for the structural and microstructural analysis. The magnetic property was measured using vibrating sample magnetometer (VSM) at room temperature. X-ray diffraction studies show the formation of single phase spinel structure of the thin film. The octahedral and tetrahedral vibration in the sample was studied by Fourier transform infrared (FT-IR) spectra. Magnetic hysteresis loop was recorded for thin film at room temperature. At 15 kOe, saturation magnetization (Ms) was found to increase while coercivity (Hc) decreases with thickness of the $NiFe_2O_4$ thin film.

Topics

Magnetic properties, Magnetic equipment, Magnetic hysteresis, Glass, Fourier transform spectroscopy, Thin films, X-ray diffraction, Nanomaterials, Pyrolysis, Chemical compounds

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