Journal of Magnetics 12(4), 141-143 (2007)

Microstructure of the Oriented Hexagonal $HoMnO_3$ Thin Films by PLD

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(Received 30 November 2007)

We have fabricated (0001) oriented hexagonal $HoMnO_3$ thin films with thickness of 300 nm using Pulsed Laser Deposition (PLD) technique on Pt(111)/Ti/SiO_2/Si substrates. The XRD θ-2θ pattern shows only (0002), (0004), and (0008) reflection of a hexagonal phase, and the full width at half maximum (FWHM) of (0004) peak is under 1.6°. The chemical state of Mn from XPS spectra of the films reveals the presence of Mn^{3+} only. The temperature dependence of dielectric constant shows a weak anomaly at magnetic Néel temperature (T_N), which is about 70 K.

Keywords : multiferroic, $HoMnO_3$, thin film