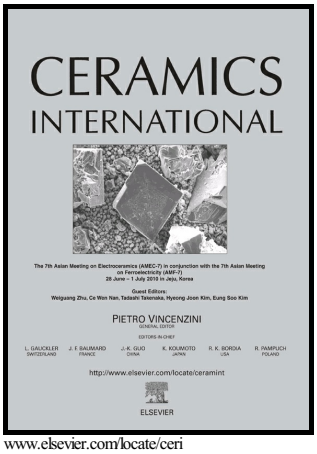


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B. Bagyalakshmi, M. Veera Gajendra Babu, N. Lakshminarasimhan, B. Sundarakannan

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# Temperature-induced strain mediated magnetization changes in $NiFe_2O_4/BaTiO_3$ heterostructure

**B. Bagyalakshmi[a], M. Veera Gajendra Babu[a], N. Lakshminarasimhan[b,c], B. Sundarakannan[a*]**

[a]Department of Physics, Manonmaniam Sundaranar University, Tirunelveli- 627 012, India.

[b]Functional Materials Division and [c]Academy of Scientific and Innovative Research,CSIR-Central Electrochemical Research Institute, Karaikudi - 630 003, India.

[*]**Corresponding author.** B. Sundarakannan Tel.: +91 9487410736.

sundarakannan@msuniv.ac.in



## Abstract

Herein, we report the temperature-induced magnetization changes of $NiFe_2O_4$ thin film, which is coated over a ferroelectric $BaTiO_3$ ceramic substrate. The solid-state reaction method was adopted for the preparation of ferroelectric $BaTiO_3$ (BT) substrate, whereas $NiFe_2O_4$ (NFO) film was deposited by spin-coating method. Rietveld refinement revealed that BT substrate has a tetragonal (*P4mm*) crystal system along with a minor orthorhombic phase (*Amm2*) at room temperature. The GIXRD analysis confirms the phase purity of NFO/BT heterostructure. Polarization hysteresis with respect to electric field (P-E loop) and the temperature-dependent dielectric measurement of BT substrate demonstrate its typical ferroelectric and phase transition behavior, respectively. Magnetization hysteresis loops were recorded for the NFO/BT heterostructure at 150, 240 and 300 K. A significant increase in the remnant magnetization ($M_R$) and coercive field ($H_C$) of NFO film are noticed while cooling