

## Accepted Manuscript

Electrically Heterogeneous High Dielectric  $\text{BaTi}_{0.4}(\text{Fe}_{0.5}\text{Nb}_{0.5})_{0.6}\text{O}_3$  Ceramic

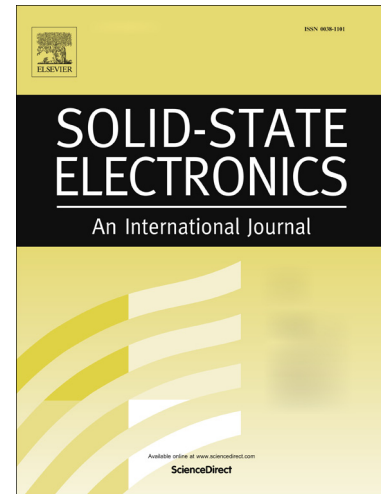
Piyush Kumar Patel, K.L. Yadav

PII: S0038-1101(16)30220-9  
DOI: <http://dx.doi.org/10.1016/j.sse.2017.03.008>  
Reference: SSE 7207

To appear in: *Solid-State Electronics*

Received Date: 2 November 2016  
Revised Date: 6 February 2017  
Accepted Date: 3 March 2017

Please cite this article as: Patel, P.K., Yadav, K.L., Electrically Heterogeneous High Dielectric  $\text{BaTi}_{0.4}(\text{Fe}_{0.5}\text{Nb}_{0.5})_{0.6}\text{O}_3$  Ceramic, *Solid-State Electronics* (2017), doi: <http://dx.doi.org/10.1016/j.sse.2017.03.008>



This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

**Electrically Heterogeneous High Dielectric  $\text{BaTi}_{0.4}(\text{Fe}_{0.5}\text{Nb}_{0.5})_{0.6}\text{O}_3$  Ceramic**Piyush Kumar Patel<sup>1,2</sup> and K. L. Yadav<sup>2\*</sup><sup>1</sup>Department of Physics, Maulana Azad National Institute of Technology Bhopal, India<sup>2</sup>Smart Materials Research Laboratory, Department of Physics, Indian Institute of Technology Roorkee-247667, India**Abstract**

The effect of sintering temperatures on the lattice parameters, microstructure and electrical properties of  $\text{BaTi}_{0.4}(\text{Fe}_{0.5}\text{Nb}_{0.5})_{0.6}\text{O}_3$  perovskite ceramics were investigated. Impedance spectroscopy analysis confirms that this material is electrically heterogeneous which plays a major role for the high dielectric constant. The sintering temperatures have a sensitive influence on the values of the dielectric constant. High dielectric constant (12708) with low dielectric loss (0.23) was achieved at room temperature for 1250 °C sintered ceramic. Activation energy was found to be 0.25 eV and 0.31 eV corresponding to grain and grain boundary, respectively which confirms that the grain boundaries are more insulating than grains. We observed the high magnetocapacitance (5.8 %) at 9 kOe for 1250 °C sintered sample which is useful for the practical application. This study will help to modify the  $\text{BaFe}_{0.5}\text{Nb}_{0.5}\text{O}_3$  based materials and lead to more applications in the microelectronics devices.

**Keywords:** Sintering; Schottky barrier; Electrical properties; Magnetocapacitance

\*Corresponding author Tel.: +91 1332 285744; Fax: +91 1332 273560

E-mail: klyadav35@yahoo.com

Download English Version:

<https://daneshyari.com/en/article/5010212>

Download Persian Version:

<https://daneshyari.com/article/5010212>

[Daneshyari.com](https://daneshyari.com)