

Accepted Manuscript

Novel tin-doped BaTiO₃ ceramics with non-reducibility and colossal dielectric constant

Lingxia Li, Ruijie Wang, Shihui Yu, Zheng Sun, Haoran Zheng

PII: S0167-577X(18)30371-9
DOI: <https://doi.org/10.1016/j.matlet.2018.03.015>
Reference: MLBLUE 23976

To appear in: *Materials Letters*

Received Date: 13 December 2017
Revised Date: 1 March 2018
Accepted Date: 3 March 2018

Please cite this article as: L. Li, R. Wang, S. Yu, Z. Sun, H. Zheng, Novel tin-doped BaTiO₃ ceramics with non-reducibility and colossal dielectric constant, *Materials Letters* (2018), doi: <https://doi.org/10.1016/j.matlet.2018.03.015>

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.



Novel tin-doped BaTiO₃ ceramics with non-reducibility and colossal dielectric constant

Lingxia Li*, Ruijie Wang, Shihui Yu**, Zheng Sun, Haoran Zheng

School of Microelectronics and Key Laboratory for Advanced Ceramics and Machining Technology of

Ministry of Education; Tianjin 300072, China

*Corresponding author. Tel./fax: +86 2227402838, E-mail: lilingxia_tju66@126.com (L. Li);

**Corresponding author. Tel./fax: +86 2227402838, E-mail: ysh728@126.com (S. Yu)

Abstract

Novel BaTiO₃-based ceramics with non-reducibility and colossal dielectric constant were successfully synthesized by conventional solid-state route through the doping of Sn ions. Electrical measurements indicate that the Sn-doped BaTiO₃ ceramics show excellent dielectric and non-reductive properties. Compared with the Sn-doped BaTiO₃ ceramics sintered in air, the dielectric constant, loss tangent and insulation resistance almost have no change for the samples sintered in H₂-N₂. The Sn-doped BaTiO₃ ceramics sintered in H₂-N₂ show a colossal dielectric constant (1.2×10^4 @ 1 kHz), low loss tangent ($\sim 1.0\%$ at 1 kHz), and acceptable insulation resistance ($4.5 \times 10^{10} \Omega \cdot \text{cm}$). The mechanisms of anti-reduction and colossal dielectric constant are proposed.

Keywords: Ceramics; Dielectrics; Electrical properties; Sintering

1. Introduction

BaTiO₃ (BT) based dielectric materials are used in MLCC (Multi-Layer Ceramic Capacitor) for their friendly-environment, moderate dielectric constant and low-loss. Up until today, most MLCCs are manufactured with expensive inner electrodes of Pd or Pd-Ag alloys [1-2]. Generally, the cost of inner electrodes accounts for more than 70% of the total device cost [3]. Therefore, it is an effective way to

Download English Version:

<https://daneshyari.com/en/article/8013629>

Download Persian Version:

<https://daneshyari.com/article/8013629>

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