

Dielectric, ferroelectric, and photoluminescent properties of Sm-doped $\text{Bi}_4\text{Ti}_3\text{O}_{12}$ thin films synthesized by sol-gel method

Xingru Du, Wenhua Huang, Shuai He, T. Santhosh Kumar, Aize Hao, Ni Qin, Dinghua Bao



www.elsevier.com/locate/ceri

PII: S0272-8842(18)31915-1
DOI: <https://doi.org/10.1016/j.ceramint.2018.07.174>
Reference: CERI18896

To appear in: *Ceramics International*

Received date: 21 June 2018
Accepted date: 19 July 2018

Cite this article as: Xingru Du, Wenhua Huang, Shuai He, T. Santhosh Kumar, Aize Hao, Ni Qin and Dinghua Bao, Dielectric, ferroelectric, and photoluminescent properties of Sm-doped $\text{Bi}_4\text{Ti}_3\text{O}_{12}$ thin films synthesized by sol-gel method, *Ceramics International*, <https://doi.org/10.1016/j.ceramint.2018.07.174>

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 galley proof before it is published in its final citable 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.

Dielectric, ferroelectric, and photoluminescent properties of**Sm-doped Bi₄Ti₃O₁₂ thin films synthesized by sol-gel method**

Xingru Du, Wenhua Huang, Shuai He, T. Santhosh Kumar, Aize Hao, Ni Qin*,
Dinghua Bao*

State Key Laboratory of Optoelectronic Materials and Technologies, School of
Materials Science and Engineering, Sun Yat-Sen University, Guangzhou 510275,
China

Abstract

We report on the structure, dielectric, ferroelectric, and photoluminescent properties of Sm³⁺-doped Bi₄Ti₃O₁₂ thin films which were prepared on fused silica and Pt/Ti/SiO₂/Si substrates by sol-gel method. The X-ray diffraction analysis confirmed that the Bi_{4-x}Sm_xTi₃O₁₂ (BSmT) thin films were well crystallized in layered perovskite structure without any secondary phase. Raman spectra indicated that the structure of BSmT thin films was significantly distorted because of the Sm³⁺ doping. An appropriate doping amount of Sm³⁺ ions leads to obvious enhancement in ferroelectric and dielectric properties of BSmT thin films due to structure distortion and reduction in defects. In addition, the BSmT thin films also show orange-red color emission at 601 nm and long fluorescence lifetime (> 0.6 ms). This study indicated that lead-free BSmT thin films, which are featuring good electrical and photoluminescent properties, may have potential applications in integrated optoelectronic devices.

Keywords: BSmT thin film; dielectric; ferroelectric; photoluminescence; lifetime

* E-mail: qinni2@mail.sysu.edu.cn, stsbdh@mail.sysu.edu.cn

Download English Version:

<https://daneshyari.com/en/article/10155404>

Download Persian Version:

<https://daneshyari.com/article/10155404>

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