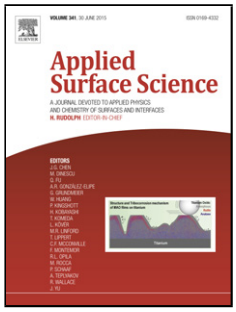

Title: Structural Properties and Electrical Conduction Mechanisms of $Bi_{0.9}Sm_{0.05}Tb_{0.05}FeO_3$ Thin Film

Authors: S. Ruby, S.S.R. Inbanathan

PII: S0169-4332(17)33524-9
DOI: https://doi.org/10.1016/j.apsusc.2017.11.231
Reference: APSUSC 37813

To appear in: *APSUSC*

Received date: 4-10-2017
Revised date: 20-11-2017
Accepted date: 27-11-2017

Please cite this article as: Ruby S, Inbanathan SSR, Structural Properties and Electrical Conduction Mechanisms of $Bi_{0.9}Sm_{0.05}Tb_{0.05}FeO_3$ Thin Film, *Applied Surface Science* (2010), https://doi.org/10.1016/j.apsusc.2017.11.231

Structural Properties and Electrical Conduction Mechanisms of $Bi_{0.9}Sm_{0.05}Tb_{0.05}FeO_3$ Thin Film

S. Ruby[1,2] and S.S.R. Inbanathan[2*]

[1]*Mother Teresa Women's University, Kodaikanal-624102, India.*

[2]*Post Graduate and Research Department of Physics, The American college, Madurai-625002, India*

*Corresponding Authors: stepheninbanathan@gmail.com

Highlights

- $Bi_{0.9}Sm_{0.05}Tb_{0.05}FeO_3$ thin films were grown on $SrTiO_3$ (100) substrates by hydrothermal method are reported. Structure, ferromagnetic and dc electrical properties of BSTFO thin films are reported. The average particle size from SEM analysis is ~3-4 µm. The cross sectional SEM image gives the average thickness of the BSTFO film as ~5 µm.
- As a result of Bi-O bonds, the XPS spectra of Bi 4*f* is having two bands. Two peaks of Bi 4*f* bands were centered at 158 and 163 eV which confirm the 3+ oxidation state of Bi.

  The $2P_{3/2}$ core level for Fe^{3+} and Fe^{2+} ions appears at 710.8 and 709.4 eV shows the XPS spectrum covering 706-714 eV. The O 1*s* XPS spectra of BSTFO films showing a slightly asymmetric peak at ~ 530 eV.
- The magnetization curve of blank STO substrate obviously shows the linear diamagnetic nature. The coercivity (H_C) and remnant magnetization (M_r) values were