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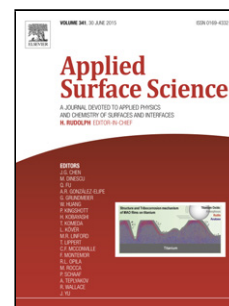
Title: Structural Properties and Electrical Conduction Mechanisms of  $\text{Bi}_{0.9}\text{Sm}_{0.05}\text{Tb}_{0.05}\text{FeO}_3$  Thin Film

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# Structural Properties and Electrical Conduction Mechanisms of $\text{Bi}_{0.9}\text{Sm}_{0.05}\text{Tb}_{0.05}\text{FeO}_3$ Thin Film

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## Highlights

- $\text{Bi}_{0.9}\text{Sm}_{0.05}\text{Tb}_{0.05}\text{FeO}_3$  thin films were grown on  $\text{SrTiO}_3$  (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  $\sim 3\text{-}4\ \mu\text{m}$ . The cross sectional SEM image gives the average thickness of the BSTFO film as  $\sim 5\ \mu\text{m}$ .
- 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  $\text{Fe}^{3+}$  and  $\text{Fe}^{2+}$  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  $\sim 530\ \text{eV}$ .
- The magnetization curve of blank STO substrate obviously shows the linear diamagnetic nature. The coercivity ( $H_C$ ) and remnant magnetization ( $M_r$ ) values were

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