

Narrow Optical Gap Ferroelectric Bi₂ZnTiO₆ Thin Films Deposited by RF Sputtering

Wednesday, September 11, 2019 2:05 PM (20 minutes)

This work reports the deposition of single phase Bi₂ZnTiO₆ thin films onto Pt/Si-based substrates using rf-sputtering method and the respective structural, morphological, optical and local ferroelectric characterization. The thin film grows in the polycrystalline form with tetragonal P4mm symmetry identified by X-ray diffraction. The lack of spatial inversion centre was confirmed by the second harmonic generation. A narrow indirect optical gap of 1.48 eV was measured using optical diffuse reflectance. The ferroelectric domain reversal was further demonstrated through piezo-response force microscopy. This work demonstrates a practical method to fabricate the BZT perovskite phase with outstanding optical and ferroelectric properties, without recurring to high pressure and temperature conditions necessary to synthesize the bulk form.

[1] J. Mater. Chem. A 2019 doi: 10.1039/C8TA09425J

Summary

This work reports the deposition of single phase Bi₂ZnTiO₆ thin films onto Pt/Si-based substrates using rf-sputtering method and the respective structural, morphological, optical and local ferroelectric characterization. The thin film grows in the polycrystalline form with tetragonal P4mm symmetry identified by X-ray diffraction. The lack of spatial inversion centre was confirmed by the second harmonic generation. A narrow indirect optical gap of 1.48 eV was measured using optical diffuse reflectance. The ferroelectric domain reversal was further demonstrated through piezo-response force microscopy. This work demonstrates a practical method to fabricate the BZT perovskite phase with outstanding optical and ferroelectric properties, without recurring to high pressure and temperature conditions necessary to synthesize the bulk form. [1] J. Mater. Chem. A 2019 doi: 10.1039/C8TA09425J

Topic

1. Multiferroics and ferroelectrics

Primary author: FIGUEIRAS, Fábio (IFIMUP & Physics and Astronomy Department, Sciences Faculty, Porto University)

Presenter: FIGUEIRAS, Fábio (IFIMUP & Physics and Astronomy Department, Sciences Faculty, Porto University)

Session Classification: Afternoon Session 1