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Narrow Optical Gap Ferroelectric Bi2ZnTiO6 Thin Films Deposited by RF Sputtering

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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 synthetize the bulk form.
[1] J. Mater. Chem. A 2019 doi: 10.1039/C8TA09425J

Summary

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Topic

1. Multiferroics and ferroelectrics

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