

MaMaSELF



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Lead free piezoelectric thin films and powders

Piezoelectric materials are nowadays intensively used in numerous fields of modern society (sensors, energy harvesters from vibrations, etc.). The research work focuses on tetragonal tungsten bronze (TTB) phases that have received little attention until now compared to perovskite phases, although TTB structures have diverse properties (e.g. nonlinear optic, pyroelectric, and piezoelectric) as a result of their compositional flexibility. The project involves the synthesis of powders by various methods like solid state reaction, flux method, seeding etc. and the synthesis of thin films and nanorods films by pulsed laser deposition (PLD) with an emphasis on compositional, microstructural and orientation control. It also includes the study of the impact of parameters (targets composition, laser energy and frequency, substrates, ...), on morphology and growth of thin films and nanorods. The samples are characterized by X-ray diffraction, scanning electron microscopy, energy dispersive X-ray spectroscopy.

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