

PREPARATION AND INVESTIGATION OF PLZT THIN FILMS NEAR THE MORPHOTROPIC PHASE BOUNDARY

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Lanthanum-doped lead zirconate titanates $\text{Pb}_{1-x}\text{La}_x(\text{Zr}_{0.65}\text{Ti}_{0.35})_{1-x/4}\text{O}_3$ (PLZT) are much investigated electroceramic materials because of their excellent electrooptic application potential. Moreover, the composition near the morphotropic phase boundary ($x=0.09$) shows the freezing dynamic phenomena that attract attention from the fundamental point of view.

In this work PLZT ferroelectric thin films with different thickness (from 50 up to 500 nm) were prepared by sol-gel method using the commercial Pt/TiO₂/SiO₂/Si as well as SiO₂ passivated/Indium Tin Oxide (ITO) coated on surface substrates. It was observed that the texture orientation was very sensitive to the preparation routine in the case of Pt coated Si wafers that might be related to the peculiarities of interfacial layer formation during the pyrolysis and crystallization treatments whereas only highly (110) oriented films were successfully grown on ITO coated SiO₂ substrates. The analysis of X-ray diffraction data revealed formation of pure perovskite phase in both cases. The dielectric (in the range of $10\div 10^6$ Hz) as well as optic (transmission and reflectance in the wave-length window of 220÷2500 nm) spectra were investigated. The interrelation between processing, structure and physical properties is analysed and the results are presented.

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