

Abstract Submitted
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Synthesis and characterization of novel room temperature single phase multiferroics DILSOM SANCHEZ, ASHOK KUMAR, RAM S. KATIYAR — Room temperature single phase multiferroics (MF) thin films of $\text{Pb}(\text{Zr}_{0.53}\text{Ti}_{0.47})_{1-x}(\text{Fe}_{0.50}\text{Ta}_{0.50})_x\text{O}_3$ (PZFT) ($x= 0.10, 0.20, 0.30, 0.40$) were fabricated by pulse laser deposition technique (PLD). Surface topography of these films showed well defined grain with average grain size ~ 20 -100 nm, the grain size increases with increase in Ta and Fe compositions. The surface roughness (~ 2 -8 nm) also increases with increase in Fe and Ta compositions. All of these films indicated low dielectric loss, low leakage current, and high dielectric constant. The dielectric constant maximum temperature shifted to lower temperature with increase in iron and tantalum concentrations. The magnetization vs. applied magnetic field (M-H) curves showed well defined hysteresis with remanent magnetization ($M_r \sim 0.004$ -0.13 emu/gm) and very small coercive field (900 Oe). The AC and DC conductivities of PZTFT showed very low conductivity ($\sim 10^{-9}$ to 10^{-7} S/cm $^{-1}$) at room temperature. These films displayed very high polarization $\sim (60$ - 75 $\mu\text{C}/\text{cm}^2$) at room temperature.

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