

Domain Wall Motion in A and B Site Donor-Doped $\text{Pb}(\text{Zr}_{0.52}\text{Ti}_{0.48})\text{O}_3$ Films

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Abstract: Donor-doped $\text{PbZr}_{0.52}\text{Ti}_{0.48}\text{O}_3$ (PZT) films were utilized to study the effect of dopants on the mobility of ferroelectric domain walls. For chemical solution deposited PZT films 2 μm in thickness, doped with 1%- 4% Nb or La, the low field dielectric permittivity remained between 1100 and 1300. With increasing Nb concentration, both the reversible and irreversible Rayleigh constants increased from $\epsilon'(\text{init})$ and α' of 1150 and 39 cm/kV , respectively, for undoped PZT films to 1360 and 43 cm/kV for films doped with 2 mol% Nb. La doping increased the irreversible Rayleigh constant but did not strongly affect the reversible Rayleigh parameter. These observations are consistent with softening of the dielectric and electromechanical response with donor doping.

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