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Studies of Magnetoelectric properties in $(1-x)\text{Pb}(\text{Fe}_{2/3}\text{W}_{1/3})\text{O}_3$ - $x\text{PbTiO}_3$ solid solutions thin films ASHOK KUMAR, University of Puerto Rico, RAM KATIYAR, University of Puerto Rico — We have fabricated $(1-x)\text{Pb}(\text{Fe}_{2/3}\text{W}_{1/3})\text{O}_3$ - $x\text{PbTiO}_3$ (PFWT) ($x=0.50$) thin films on Pt/Si substrates using sol-gel technique. The XRD patterns revealed a single-phase nature of the compound. The microstructure and surface morphology were investigated using SEM and AFM techniques that indicated good homogeneity and had surface roughness of 10-15 nm with particle size of ~ 30 -50 nm. The dielectric relaxation studies in these films were carried out measured in the temperature range of 100K-650K and the frequency range of 100Hz-1MHz. Raman and dielectric data indicate that the crystal structure changes from tetragonal to cubic i.e. a ferroelectric phase transition at 575K. The dielectric properties of PFWT thin films were studied in the temperature range 80-600 K over a wide range of frequencies. The slope of the reciprocal of the dielectric constant is 2:1, matched well with the simplest Landau free energy model and it indicates continuous second order displacive ferroelectric phase transition. The polarization hysteresis curve at room temperature illustrated a ferroelectric nature. The detailed of magnetic and magneto electric properties with of PFWT will be discussed.

Ashok Kumar
University of Puerto Rico

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