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Ferroelectric Phase transition in (1-x)Pb($Fe_{2/3}W_{1/3}$)O_3-xPbTiO_3 solid solutions thin films ASHOK KUMAR, University of Puerto Rico, N.M. MURARAI, RAM S. KATIYAR, University of Puerto Rico — We have deposited thin films of (1-x)Pb($Fe_{2/3}W_{1/3}$)O_3-xPbTiO_3 (PFWT) on Pt/Si substrates. The metamorphic phase diagram of PFWT solid solution indicates that it changes from natural relaxor to an ordered ferroelectric state above x = 0.33 of lead titanate concentration. The microstructure and surface morphology were investigated using SEM and AFM techniques that indicated surface roughness of 10-15 nm with particle size of $\sim$ 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. The ferroelectric phase transition was found at 575K for all frequencies. The Relaxation indication coefficient ($\gamma \sim$1.30) was estimated from a linear fit of the modified Curie-Weiss law and results suggested a long range ordering. The temperature dependant micro Raman studies revealed a ferroelectric phase transition from tetragonal to cubic phase above 575K. The polarization hysteresis curve at room temperature illustrated a ferroelectric nature of the material having ramanat polarization (P_r) to be 3μC/cm^2 and the saturation polarization (P_s) 30μC/cm^2.

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