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SOL-GEL DERIVED (Pb,La)(Zr,Ti)O_3 THIN FILMS

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The spun-cast PLZT (9/65/35) thin films through polymeric sol-gel process were prepared on Pt substrate. The crack-free, uniform and dense films were obtained by post-annealing at the temperature between 450 and 700 °C. The composite structures mixed together with large grains called "rosette" and surrounding small grains were observed on the films annealed over 600 °C. Pyrochlore phase was completely changed to perovskite phase above 600 °C with the increase of annealing temperature. Dielectric constant ε' was larger with the increase of film thickness and annealing temperature. The dielectric constant of 5 times-coated thin film (3500 Å) and 10 times-coated thin film (7500 Å) annealed at 700 °C was 275 and 660, respectively. From the measurements of dielectric constant as a function of measuring temperature, it was also observed that Curie temperature was shifted to higher temperature with the increase of film thickness and annealing temperature. 10 times-coated thin film annealed at 700 °C had a remnent polarization P_r of 4.59 μC/cm^2, a coercive field E_c of 36.32 kV/cm and a pyroelectric coefficient P of 65 nC/cm^2·K.