Growth and properties of chemical solution deposited $BiInO_3$-$PbTiO_3$ films

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Abstract: The dielectric, ferroelectric, and piezoelectric properties of chemical solution deposited $xBiInO_3$-$(1-x)PbTiO_3$ ($0.10 <= x <= 0.35$) thin films on platinized silicon substrates were investigated. Using a $PbTiO_3$ seed layer, phase pure $xBiInO_3$-$(1-x)PbTiO_3$ ($0.10 <= x <= 0.35$) thin films were prepared. For a 470 nm thick $0.15BiInO_3$-$0.85PbTiO_3$ film, the room temperature permittivity was 650, while the dielectric loss tangent was below 2%. The coercive field and remanent polarization were 73 kV/cm and 22 $\mu C/cm^2$, respectively. The ferroelectric transition temperatures of the $xBiInO_3$-$(1-x)PbTiO_3$ ($x= 0.10$-0.20) films were all in excess of 550 ºC. For $x= 0.15$, the $e_{31,f}$ piezoelectric coefficient was -2.7 C/m^2. (C) 2009 American Institute of Physics. [doi:10.1063/1.3250165]