Growth and properties of chemical solution deposited BiInO$_3$-PbTiO$_3$ films

Author(s): Ko SW (Ko, S. W.)$^1$, Yeo HG (Yeo, H. G.)$^{1,2}$, Trolier-McKinstry S (Trolier-McKinstry, S.)$^1$

Addresses:
1. Penn State Univ, Mat Res Inst, University Pk, PA 16802 USA
2. Changwon Natl Univ, Dept Nano & New Mat Engn, Chang Won 641773, Gyeongnam South Korea

Source: APPLIED PHYSICS LETTERS Volume: 95 Issue: 16 Article Number: 162901 Published: OCT 19 2009

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 µC/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]