TF-P48

Characterization of direct-patternable PZT/SBT multilayer films formed by photochemical metal-organic deposition

Cho-Young Lee[1], Hyeong-Ho Park1, A. Sivasankar Reddy[1], Hyung-Ho Park[1], Tae Song Kim[2]

[1]Department of Ceramic Engineering, Yonsei University
[2]Korea Institute of Science and Technology

The electric and ferroelectric properties of lead zirconate titanate (PZT) and strontium bismuth tantalate (SBT) multilayer films prepared using photosensitive starting precursors were characterized. The electric and ferroelectric properties were investigated by characterization of the effect of stacking order of four ferroelectric layers of PZT or SBT in the multilayer films of 4-PZT, PZT/2-SBT/PZT, SBT/2-PZT/SBT, and 4-SBT. The P_r value of the 4-SBT multilayer film was relatively small (6 $\mu C/cm^2$) and a two times higher value (12 $\mu C/cm^2$) was obtained with the SBT/2-PZT/SBT multilayer film. The films with SBT layers at the top and bottom showed improved leakage current and fatigue resistance compared to the films with PZT layers at the top and bottom. It was revealed that the defect dipole was reduced at the SBT/Pt interface due to a self-regulation layer such as $(Bi_2O_2)^{2+}$ in the SBT film. Also, the bottom layer on the Pt substrate showed a significant influence on the growth orientation of the entire ferroelectric films.