

Abstract Submitted
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Effects of gamma-ray irradiation on the electrical properties of ferroelectric thin films¹ SANG DON BU, SAM YEON CHO, SIN WOOK KANG, Chonbuk Natl Univ, OXIDE LAB TEAM — We have investigated the effects of gamma-ray irradiation on the electrical properties of ferroelectric thin films such as PbTiO_3 , $\text{Pb}(\text{Zr}_{0.52}\text{Ti}_{0.48})\text{O}_3$, $(\text{K}_{0.5}\text{Na}_{0.5})(\text{Mn}_{0.005}\text{Nb}_{0.995})\text{O}_3$. The thin films were prepared on Pt/Ti/SiO₂/Si substrate using a chemical solution deposition method through a spin-coating process and were subject to gamma-ray radiation at various total doses from 0–3000 kGy. The structural properties as well as the ferroelectric and dielectric properties of the prepared films were examined before and after the gamma-ray irradiation. We found that their crystalline quality did not vary with an increase in the total dose. It was also observed that the remnant polarization value of the films decreased by ~10%, but the films maintained ferroelectricity even after the irradiation up to 3000 kGy. In addition, the dielectric constant of the films decreased gradually with the total dose. The observed variation of the electrical properties on the total dose might be mainly associated with the mobile defects in the thin films such oxygen vacancies and the stored energy gained from the gamma-ray.

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Sang Don Bu
Chonbuk Natl Univ

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