

Crystal Structure and Dielectric Properties of (Ba, Sr)TiO₃ Thin Films Grown on Perovskite Metallic Oxide Electrode

페로브스카이트 산화물 전극위에 성장된 (Ba,Sr)TiO₃ 박막의 결정구조와 유전 특성

Su-Jae Lee, Seok-Kil Han and Kwang-Yong Kang

이수재, 한석길, 강광용

*Telecommunication Basic Research Laboratory, Electronics and
Telecommunications Research Institute, Yuseong, Taejon 305-350*

대전광역시 유성구 가정동 한국전자통신연구원 원천기술연구본부

(Ba, Sr)TiO₃ (BST) thin films were prepared by pulsed laser deposition on the perovskite conductive LaNiO₃(LNO) and YBa₂Cu₃O_{7-δ}(YBCO) films, and Pt as a bottom electrode. The LNO and YBCO films were deposited on SiO₂/Si and MgO substrates, respectively. The crystalline nature and surface microstructure of the BST grown on several substrates was characterized by x-ray diffraction measurement and scanning electron microscopy. The influence of the electrodes on the dielectric behavior of BST thin films was investigated. The low-frequency dielectric constant and dielectric loss of the films were measured as a function of frequency and temperature in the frequency range of 0.1 Hz - 1MHz. As a result, the BST films grown on metallic oxide films showed a large dielectric dispersion and multiple dielectric relaxation behaviors below 1 MHz. The origin of these low frequency dielectric relaxations is attributed to the ionized space charge carriers such as the oxygen vacancies and a defects in BST film, the interfacial polarization in the grain boundary region, and the electrode polarization.