[III~26]

Characterization of $SrBi_2Ta_2O_9$ thin films prepared by Sol-Gel process using AFM and XPS

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Ferroelectric thin films of $Pb(Zr,Ti)O_3$ (PZT) have been intensively investigated for nonvolatile memory application since PZT thin films have been considered to be the most promising candidate for this application. However, PZT thin films have some problems such as fatigue and imprinting characteristics. Recently it was reported that $SrBi_2Ta_2O_9$ (SBT) thin films having a layered perovskite structure have a good fatigue endurance.

In this study, ferroelectric SBT thin films were prepared on $Pt/Ti/SiO_2/Si(100)$ substrates using Sol-Gel process. Structural and surafce morphological properties of SBT films as a function of firing temperature were investigated by X-ray Diffractometry (XRD) and Atomic Force Microscopy (AFM). Surface composition, depth profile and chemical bonding characteristics of SBT thin films also investigated by X-ray Photoemission Spectroscopy (XPS). It was found that the chemical compositions and chemical bondings of ions in the near surface are different from those in the bulk region of the films. Oxygen enrichment in the near surface region was observed, while bismuth was deficient in the near surface region of the films. Further details on experimental results will be discussed.

감사의 글

본 연구는 한국전자통신연구소의 차세대반도체 선행기초기술연구사업의 지원으로 수행하였습니다.