Non-destructive analysis on the interface of PZT/Pt system using X-ray photoelectron spectroscopy
X-ray 광전자 분광기를 이용한 PZT/Pt 계면의 비파괴적 분석

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Ferroelectric thin films have investigated with much attention for their applications to electro-optic, pyroelectric, piezoelectric, and especially, memory devices. Lead zirconate titanate $Pb(Zr_xTi_{1-x})O_3$ thin films are currently under intensive investigation for use in non-volatile memory applications due to their good ferroelectric properties. When PZT thin films are deposited on a metal electrode, interfaces between PZT and electrode are formed. The ferroelectric properties of PZT films have been considered to be dependent on the interfacial state between PZT and electrode. In this study, the interface state of PZT/Pt system has been investigated using X-ray photoelectron spectroscopy (XPS).

PZT thin fims were deposited on the $Pt/SiO_2/Si$ substrate by a RF magnetron sputtering method and then an ultra thin Pt upper electrode was grown on PZT substrate. Angle-resolved XPS technique was used to non-destructively analyze the chemical states at the interface between PZT and Pt. The oxidation and reduction behavior of interface with respect to depth also was revealed. From the above analyses, the changes of composition and chemical states in interface were found.