# Unipolar and bipolar resistive switching characteristics of ZnO thin film

의승협, 용기중*
포항공과대학교
(kyong@postech.ac.kr*)

ZnO thin films were studied for non-volitile memory device application. The ZnO films were grown on Pt/Ti/$SiO_2$/Si substrate by radio frequency sputtering deposition. Prepared films were analyzed by X-ray diffraction (XRD) and attributed to polycrystalline. With top electrode deposition on the films, metal-insulator-metal (MIM) structures were fabricated and current-voltage (I-V) characteristics of the structures were measured. The structure shows reproducible and stable unipolar resistive switching (URS) after electroforming with high compliance current, regardless of the applied voltage polarity. With low compliance current at electroforming, bipolar resistive switching (BRS) was also observed; this phenomenon depended on the voltage polarity. Both states were stable and reproducible over 100 cycles. Based on the results, switching mechanism based on filament theory is proposed to explain both resistive switching.