

산화 루테늄 박막을 이용한 마이크로 슈퍼캐패시터의 제작 및 특성평가
 Fabrication and characterization of electrochemical capacitor using a
 ruthenium oxide thin film electrodes

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An all solid-state thin film electrochemical capacitor was fabricated with an amorphous and crystalline ruthenium oxide (RuO_2) thin film electrodes and an amorphous $\text{Li}_x\text{PO}_y\text{N}_z$ (Lipon) thin film electrolyte. Crystalline structure and stoichiometry of RuO_2 thin film is dependent on partial oxygen pressure during sputtering. Deposited RuO_2 thin films have excess oxygen. The effects of crystalline structure and stoichiometry on the electrochemical behavior of the $\text{RuO}_2/\text{Lipon}/\text{RuO}_2/\text{Pt}$ TFSC was characterized by a charge-discharge technique in the potential range of 0-2V. The capacity fade of electrochemical capacitor with amorphous RuO_2 thin film (Fig. 1) was larger and faster than with RuO_2 thin film. The reason is that the reaction of excess oxygen ions with Li ions in amorphous RuO_2 film during charging and discharging process is large compared to crystalline RuO_2 film due to excesses in free energy and volume. The reason of capacity fade was verified by AES and GAXRD(glancing angle x-ray diffraction).

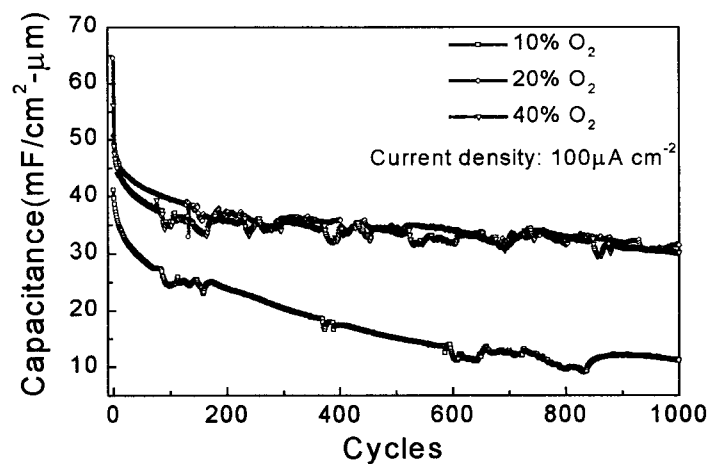


Fig. 1.