Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Resistive Switching Behaviour of $SrCoO_x$ thin films CHANG UK JUNG, OCTOLIA TOGIBASA TAMBUNAN, BO WHA LEE, Department of Physics, Hankuk University of Foreign Studies, BAE HO PARK, Division of Quantum Phases and Devices, Deparment of Physics, Konkuk University, JI-YONG PARK, Department of Physics and Division of Energy Systems Research, Ajou University, MYUNG RAE CHO, YUN DANIEL PARK, Department of Physics and Astronomy and Center for Subwavelength Optics, Seoul National University, SEUNG JIN KANG, MIYOUNG KIM, CHEOL SEONG HWANG, Department of Material Science and Engineering, Seoul National University — Resistance random access memory using metal-oxide insulator-metal structure is attracting considerable attention due to their potential high scalability and low switching current. The resistance switching behavior in many oxides is suggested to associate with local oxygen migration. An insulating brownmillerite $SrCoO_{2.5}$ has been found to transform topotactically to conducting perovskite $SrCoO_3$, due to the easy oxygen migration even at room temperature. Therefore, the $SrCoO_x$ offers a great opportunity to study the switching mechanism based on local oxygen migration. In this report, we succeed to fabricate TE/$SrCoO_x$/BE/$SrTiO_3$ devices. The fabrication process covered the 100 nm SCO on 50 nm patterened bottom electrode using pulsed laser deposition. Furthermore, the 80 nm top electrodes by litography patterning was deposited using e-beam evaporator metal deposition. From the TE/SCO/BE memory cell we observed resistance switching with some evidence of conducting filament. We discuss the switching mechanism through the analysis of composition, structure, and dimension of the filaments.

Chang Uk Jung
Department of Physics, Hankuk University of Foreign Studies

Date submitted: 15 Nov 2013 Electronic form version 1.4