Resistance Switching Phenomena in Fe2O3 Thin Films Using

Sung-Yong Lee*, Jun-Young Lee*, Byung-Soo So*, Seung-muk Bae*, Jin-ha Hwang*, Ho-Min. Lee**, Sun-Sook Lee**, Taek-Mo Chung**, Chang Gyoun Kim**, Ki-Seok An**, Yeong-cheol Kim***

*Dept. of Mat. Sci. & Eng. Hongik University, *

*Thin Film Materials Laboratory, Korea Research Institute of Chemical Technology,

***Material Eng. Korea University of Technology & Education

Abstract

Resistance Random Access Memories are regarded as one of the next-generation nonvolatile memories. Resistance switching has been found in transition metal oxides, perovskites, magneto-resistive materials, etc. The current work the switching phenomena in iron oxide prepared throuch chemical vapor deposition. The resistance switching features are characterized by current-voltage characteristics and impedance spectroscopy. The unique features are interpreted using an equivalent circuit models depending on the electrical states, i.e., unformed, on-, and off-states. The electrical characterization found the small on/off ratio unlike the initial state, i.e., the highly resistive state. The unique feature in current-voltage characteristics are attempted to be interpreted in terms of the structural change in the iron oxide.

Keyword: Iron Oxide, Chemical Vapor Deposition, Impedance Spectroscopy, Bulk, Electrical/Dielectric