JOURNAL OF SOLID STATE CHEMISTRY 12, 293 (1975)

Memory Switching in $Al-Al_2O_3-Al$ Thin Film Devices

PIERRE E. SCHMIDT, CRUZ DÁVILA, PAÚL ESQUEDA, AND ROBERTO CALLAROTTI

Centro de Ingenieria, Instituto Venezolano de Investigaciones Cientificas, Apartado 1827, Caracas, Venezuela

Received July 12, 1974

Memory switching is observed in thin (300–1500 Å) film devices composed of evaporated aluminium oxide between aluminium electrodes. Stable low frequency (60 Hz) voltage–current characteristics are obtained in the high resistivity state (off state) of the switch which depend upon the electrode area. Increasing the peak to peak value of the applied sinusoidal voltage beyond a certain threshold switching to a highly conductive state (20–60 Ω) does occur This on state is characterized by a on resistance which does not depend upon the electrode area. The on resistance increases with temperature indicating its metallic nature. Applying a high voltage pulse (approx 50 V) of short duration (<5 μsec) the switch is returned to its original off state. The threshold voltage does not decrease upon repeated cycling. This fact suggests that the metallic filament is dissolved completely each time.