

Effects of atomically engineered junction interface on resistive switching performance in Al-WO_x-Al resistive memory

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Resistive Random Access Memory (ReRAM), in which resistance state is switched by the magnitude of external electric field or bias-voltage polarity, is highly expected to be the next generation nonvolatile memory device due to its good non-volatility, simple device structure, and the easy scale-down possibility. Here, we present resistive switching phenomena in Al/WO_x/Al capacitor structures. In order to clarify the effect of the interface formed by the Al electrode and the WO_x film on resistive switching characteristics, we intentionally insert graphene or h-BN single sheet between the Al top electrode and the WO_x film. We clearly demonstrate that the resistive switching characteristics are strongly affected by the nature of the interface. We propose a resistive switching model based on the observed experimental results.