Electronic Supplementary Material (ESI) for RSC Advances.

High white-light-controlled resistance switching memory performance of Ag/ α-Fe_2O_3/FTO thin film

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Supporting Information

1. The physical nature behind the light-induced changes

An applied electrical field can result in polarization of Fe_2O_3. When applying white-light illumination, the Fe_2O_3 absorbs the light energy and transition occurs, (**Figure S1a**) which enhances the absolute values of V_{Set} and V_{Reset} to increase the number of memory logic states.

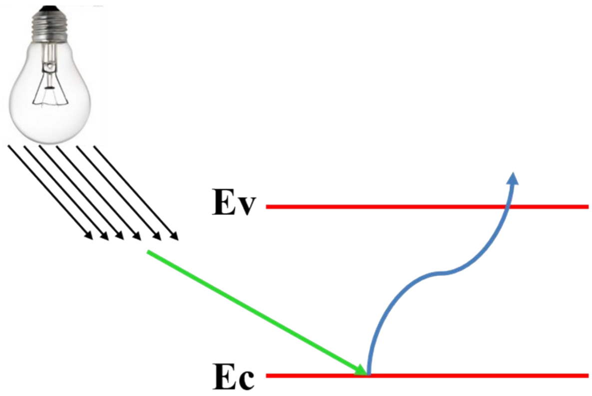

Figure S1. The physical nature behind the light-induced changes.

2. I–V plotted and fitted to a double logarithmic scale

In the **Figure S2**, the I–V characteristics of the ON state were plotted to fit in a double logarithmic scale, clearly showing an Ohmic conduction behavior with a slope of m<1.0 to strongly support the formation mechanism of the conductive paths in the device during the SET process. The fitting results m>3 at the high electric field, indicate that the charge transport behavior is in agreement with a trap-controlled space charge-limited current (SCLC) model, and the traps of oxygen vacancy are formed at the device as-prepared process.[1-3]

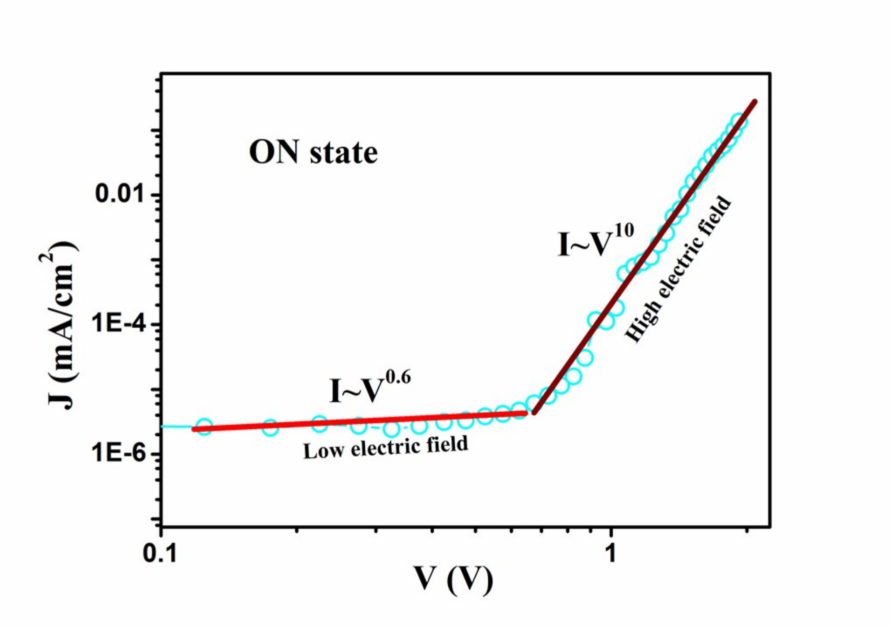

Figure S2. I–V characteristics of the positive-voltage-sweep region were plotted and fitted to a double logarithmic scale.

references

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3. G. Zhou, B. Wu, Z. Li, Z. Xiao, S. Li, P. Li, Current Appl. Phys., 2015, 15, 279-284.