Supplementary Information (SI) for Physical Chemistry Chemical Physics.
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Supplementary Information

Conduction mechanisms of filamentary resistive switching memristors based on nanoporous and nanotubular titania

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The Fig. S1 – Fig. S4 show the statistical analysis of electron microscopy images for AT-layers. The sample size for each histogram was 200 objects.

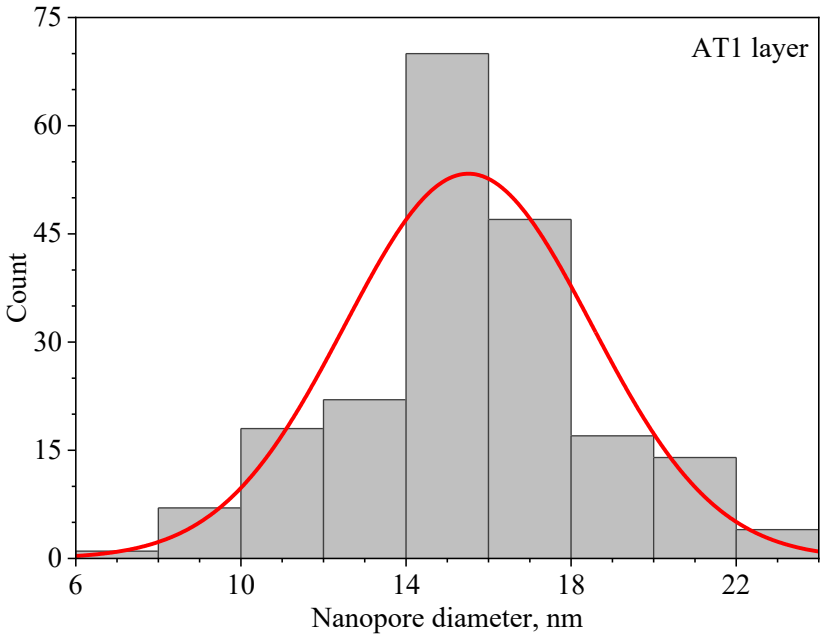

Fig. S1. Histogram of pore size distribution for AT1 memristive layer. The red solid line is a Gaussian distribution with a mean value of 15.5 nm and a standard deviation of 3.0 nm.

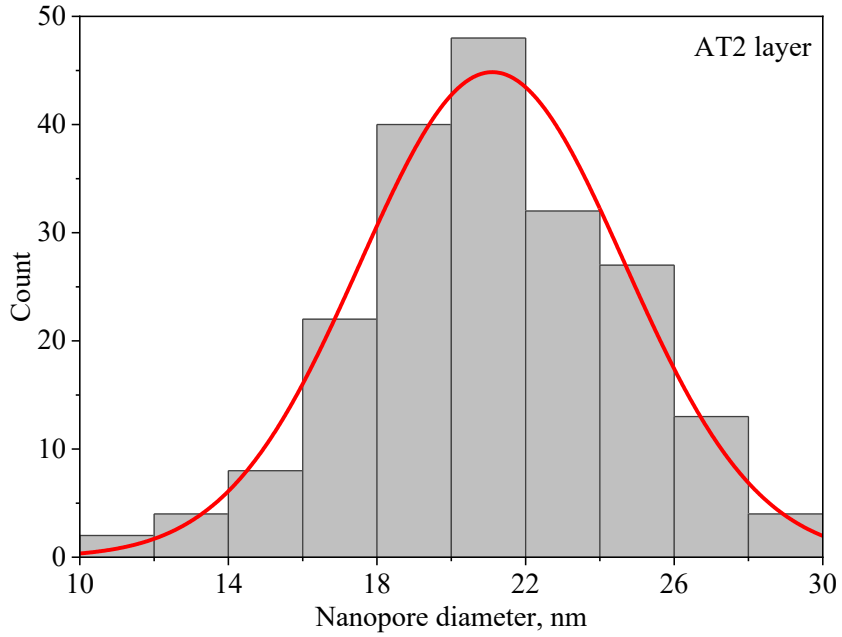

Fig. S2. Histogram of pore size distribution for AT2 memristive layer. The red solid line is a Gaussian distribution with a mean value of 21.1 nm and a standard deviation of 3.6 nm.

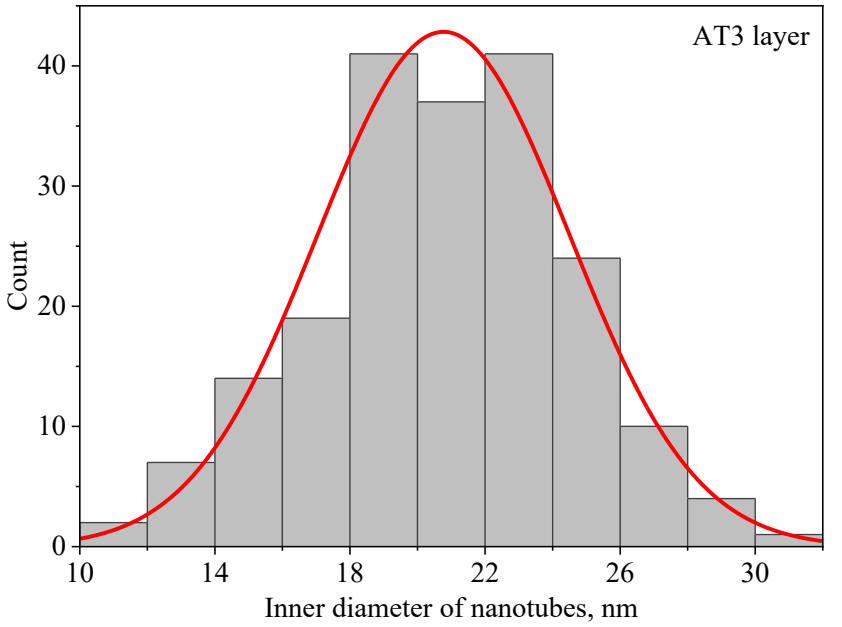

Fig. S3. Histogram of inner diameter of tube distribution for AT3 memristive layer. The red solid line is a Gaussian distribution with a mean value of 20.8 nm and a standard deviation of 3.7 nm.

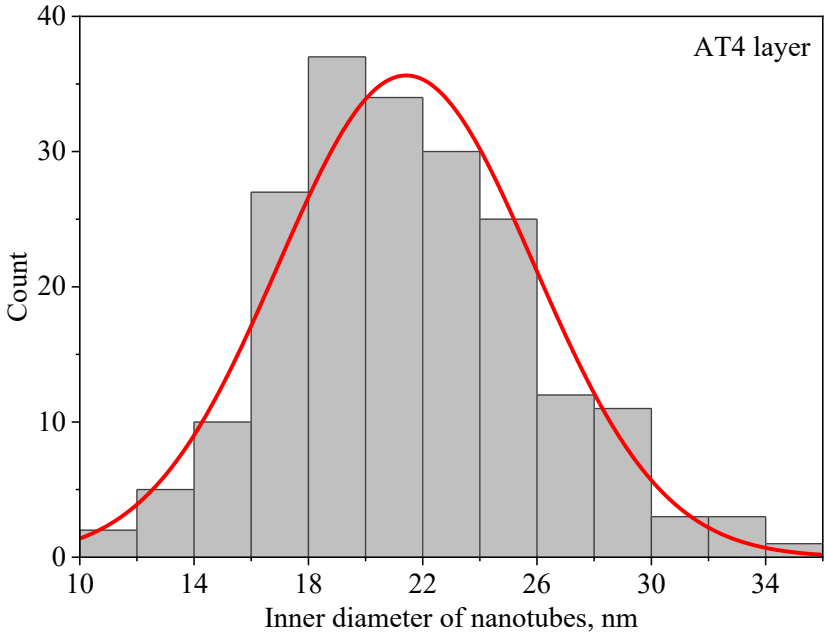

Fig. S4. Histogram of inner diameter of tube distribution for AT4 memristive layer. The red solid line is a Gaussian distribution with a mean value of 21.4 nm and a standard deviation of 4.5 nm.

The Fig. S5 – Fig. S8 show the experimental current-voltage (I-V) characteristics for the Au/AT/Ti memristors with various oxide layer morphology. The arrows indicate the order of registration of I-V characteristics. The EF curves correspond to the electroforming process.

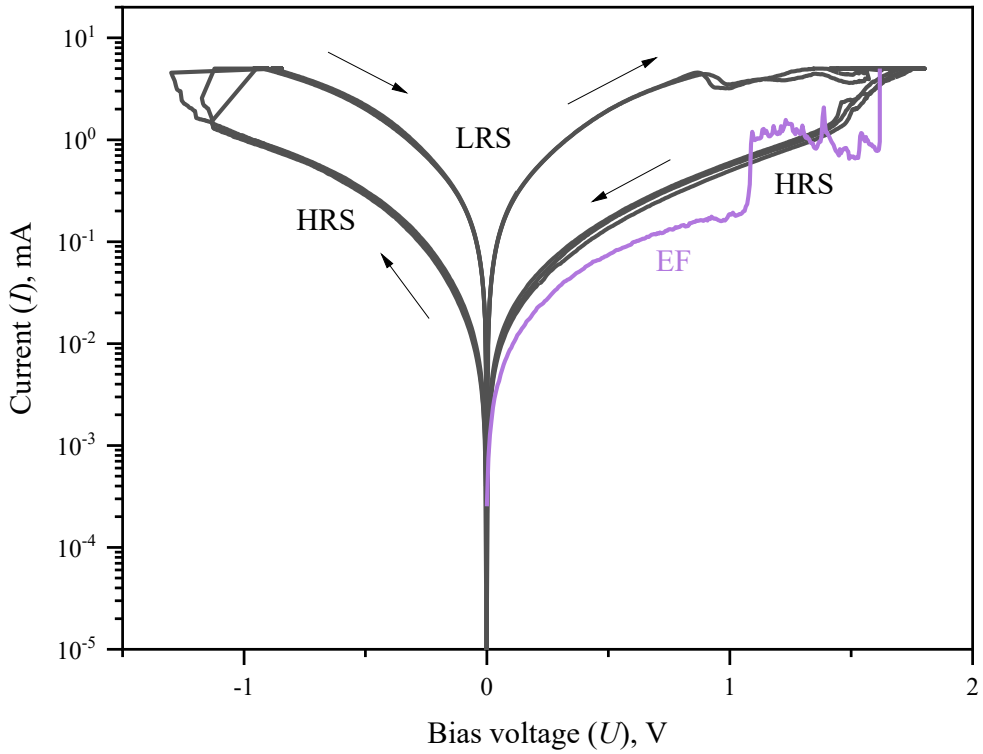

Fig. S5. I-V curves of full resistive switching cycles for Au/AT1/Ti memristors.

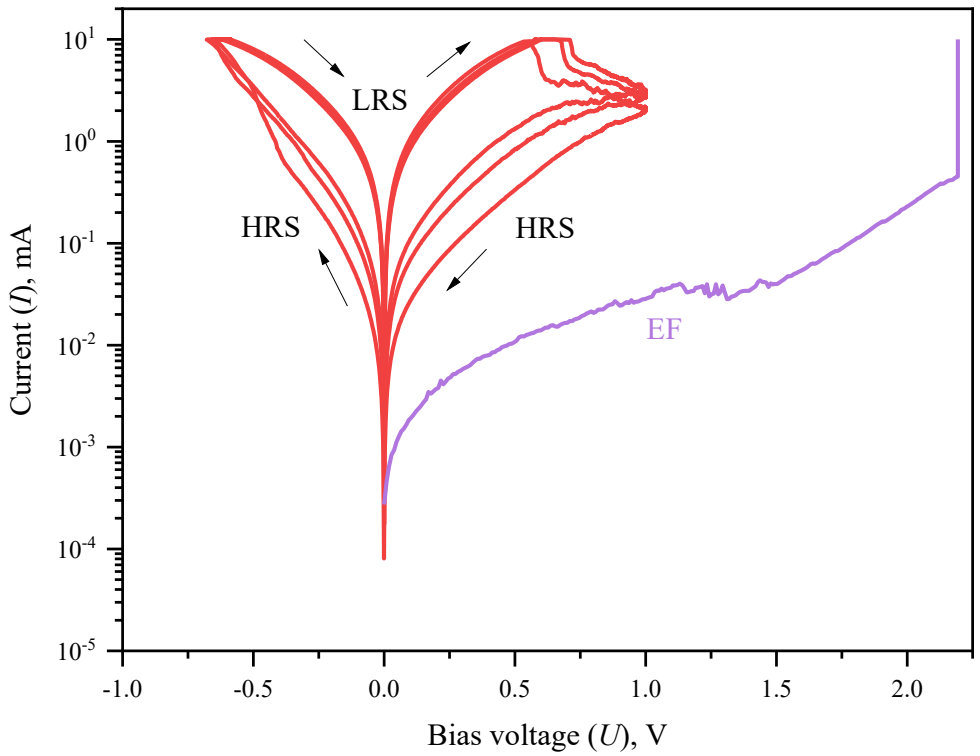

Fig. S6. I-V curves of full resistive switching cycles for Au/AT2/Ti memristors.

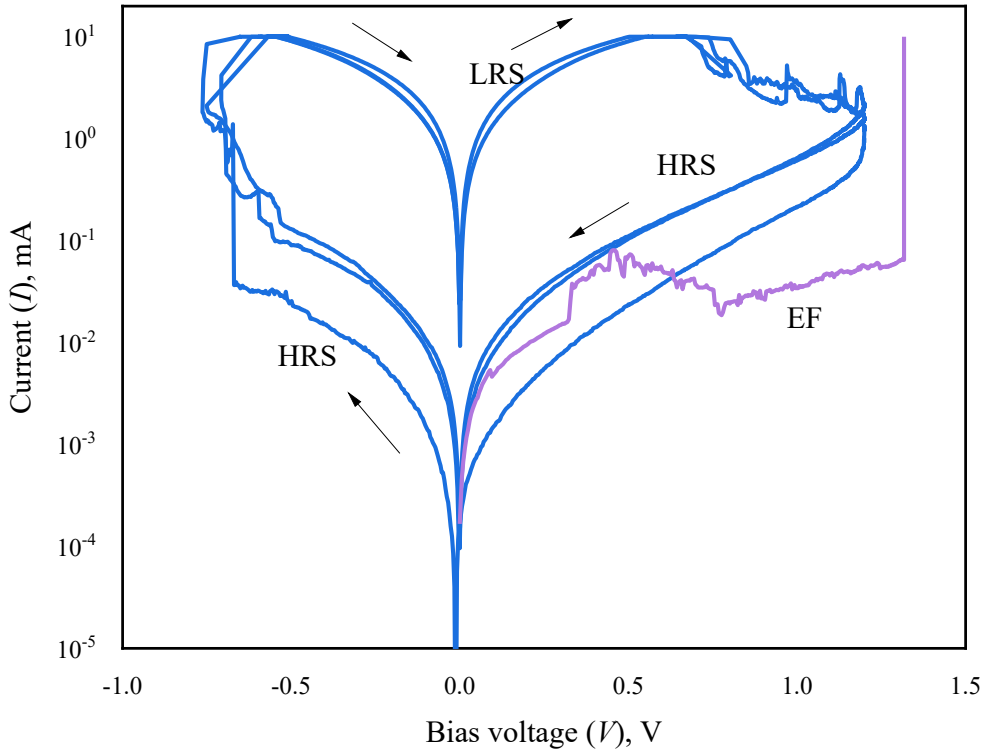

Fig. S7. I-V curves of full resistive switching cycles for Au/AT3/Ti memristors.

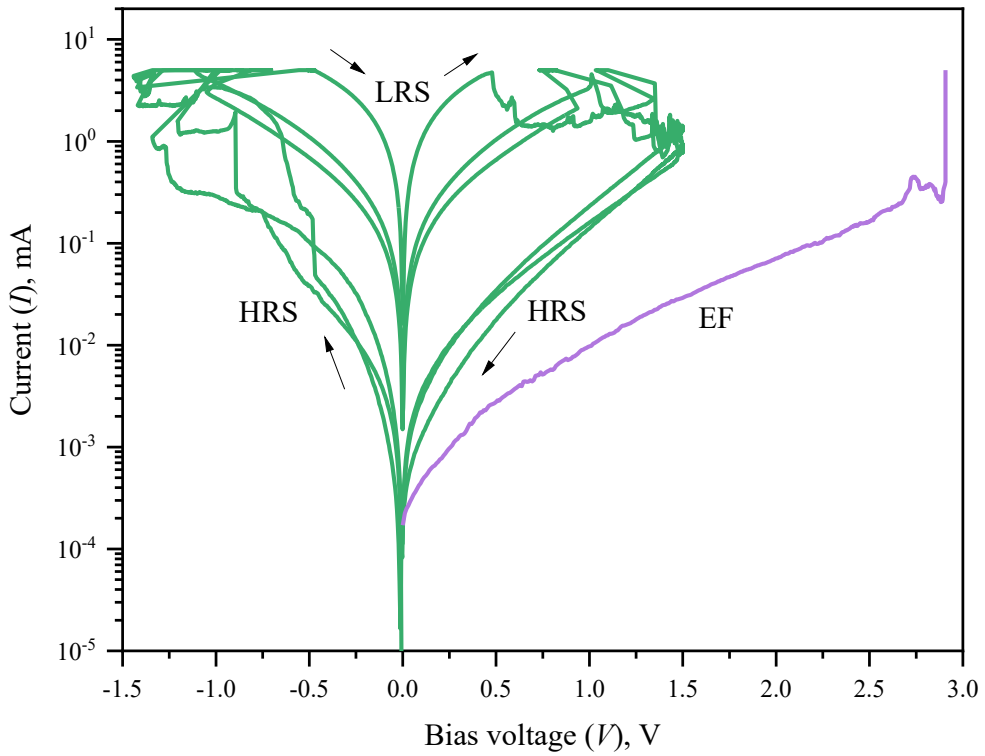

Fig. S8. I-V curves of full resistive switching cycles for Au/AT4/Ti memristors.

The Fig. S9 shows the temperature dependence of the memristor resistance in LRS based on the data from Fig 7.

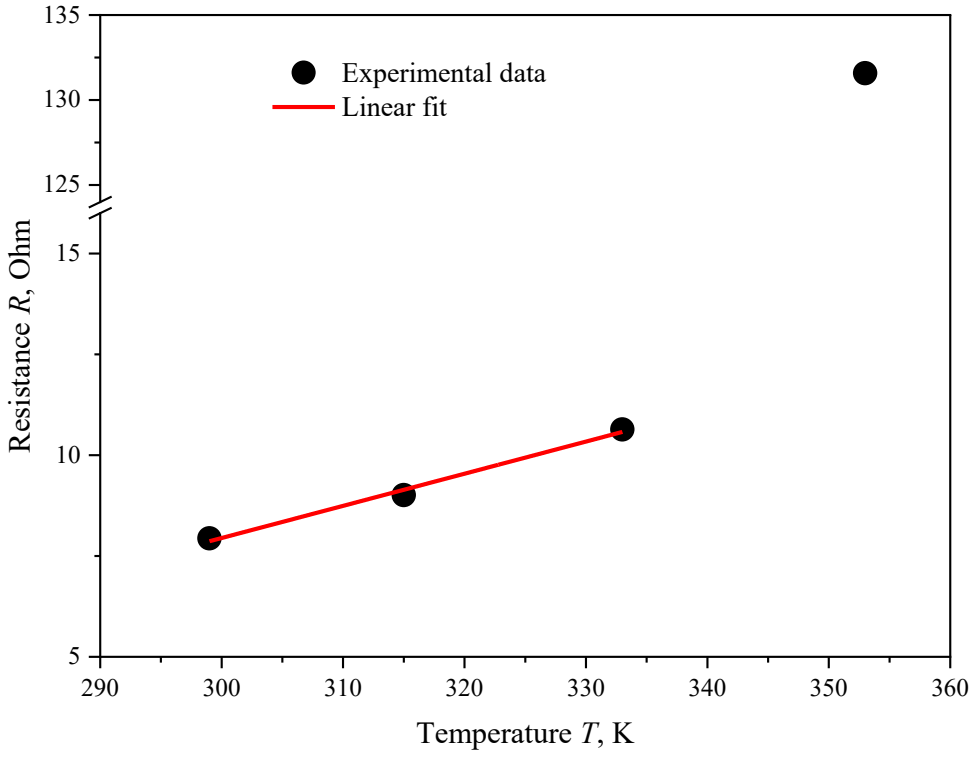

Fig. S9. Temperature-dependent resistance *R* in LRS for the AT3-based memristive structure.