

Supporting Information

Resistive Switching Non-Volatile and Volatile Memory Behavior of Aromatic Polyimides with Various Electron-withdrawing Moieties

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List of Contents for Supplementary Material:

Memory Device Characteristics of Au/DSPI/Au	<u>SI-2</u>
Figure S1. IR spectrum of polyimide (OMe) ₂ TPPA-DSPI film	<u>SI-3</u>
Figure S2. IR spectrum of polyimide (OMe) ₂ TPPA-ODPI film	<u>SI-4</u>
Figure S3. IR spectrum of polyimide (OMe) ₂ TPPA-PMPI film	<u>SI-5</u>
Figure S4. IR spectrum of polyimide (OMe) ₂ TPPA-NPPI film	<u>SI-6</u>
Figure S5. Current-voltage (I-V) characteristics of the ITO/DSPI (54 ± 3 nm)/Al memory device. (DSPI was prepared by thermal imidization).....	<u>SI-7</u>
Figure S6. Current-voltage (I-V) characteristics of the ITO/DSPI (51 ± 2 nm)/Al memory device. (DSPI was prepared by chemical imidization, coated on ITO glass, and treated with 100°C for 1h, 200°C for 1h and 300°C for 1h).....	<u>SI-8</u>
Figure S7. Current-voltage (I-V) characteristics of the Au/DSPI (51 ± 2 nm)/Au memory device.	<u>SI-9</u>
Figure S8. Current-voltage (I-V) characteristics of the ITO/ODPI (50 ± 2 nm)/Al memory device.	<u>SI-10</u>

Memory Device Characteristics of Au/DSPI/Au. Figure S7 exhibits the I-V result of Au/DSPI/Au memory device, which was measured with a compliance current of 0.01 A. During the positive and negative sweep from 0 V to 6 V or -6 V, the current increased abruptly from 10^{-13} to 10^{-3} A (high-conductivity state) at the threshold voltage of -4.2 V and 4 V indicating the transition from the OFF state to high-conductivity (ON) state. The device remained at the ON state during the subsequent negative scan and positive scan. Once Au/DSPI/Au memory device has been reached to the ON state, it remains there even after turning off power for 1 h or longer time. These results indicate that the Au/DSPI/Au device reveals non-volatile WORM memory behavior and could be turned on at positive and negative sweep. The lower switching-ON voltage of Au/DSPI/Au memory device could be ascribed to the lower gap between work function of Au (5.1 eV) and the HOMO of DSPI (5.06).

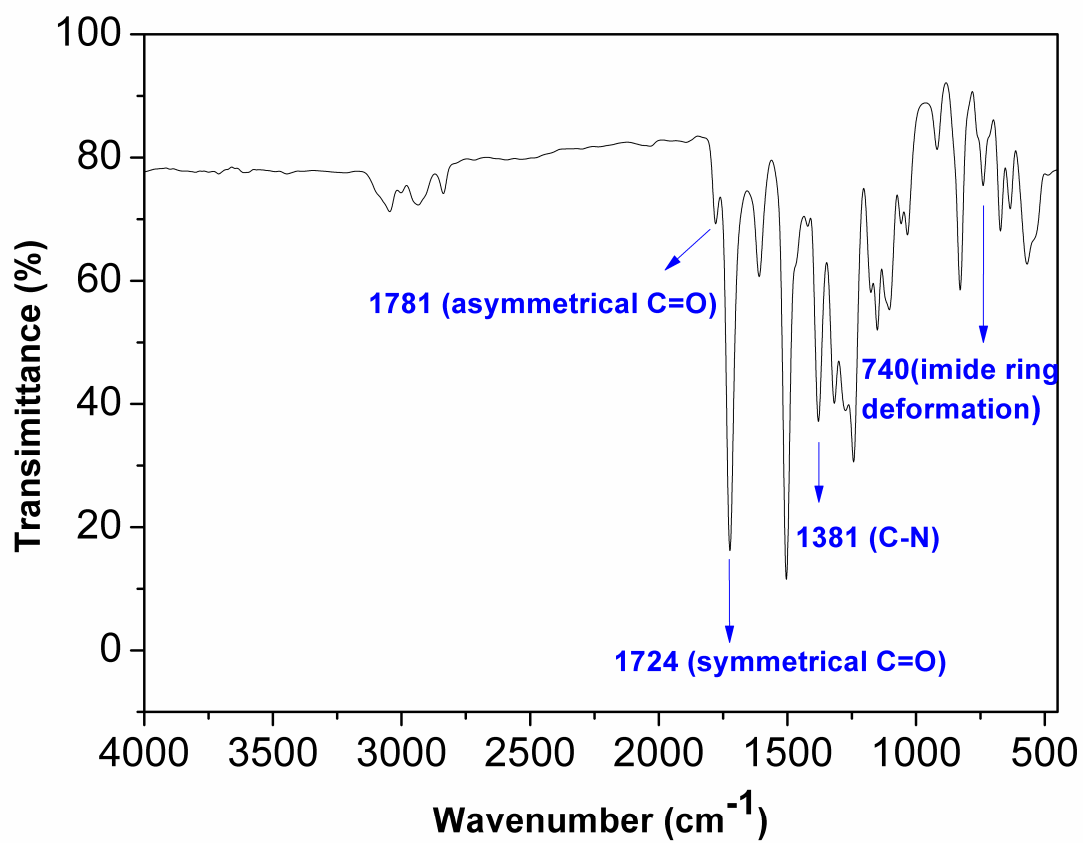


Figure S1. IR spectrum of polyimide (OMe)₂TPPA-DSPI film.

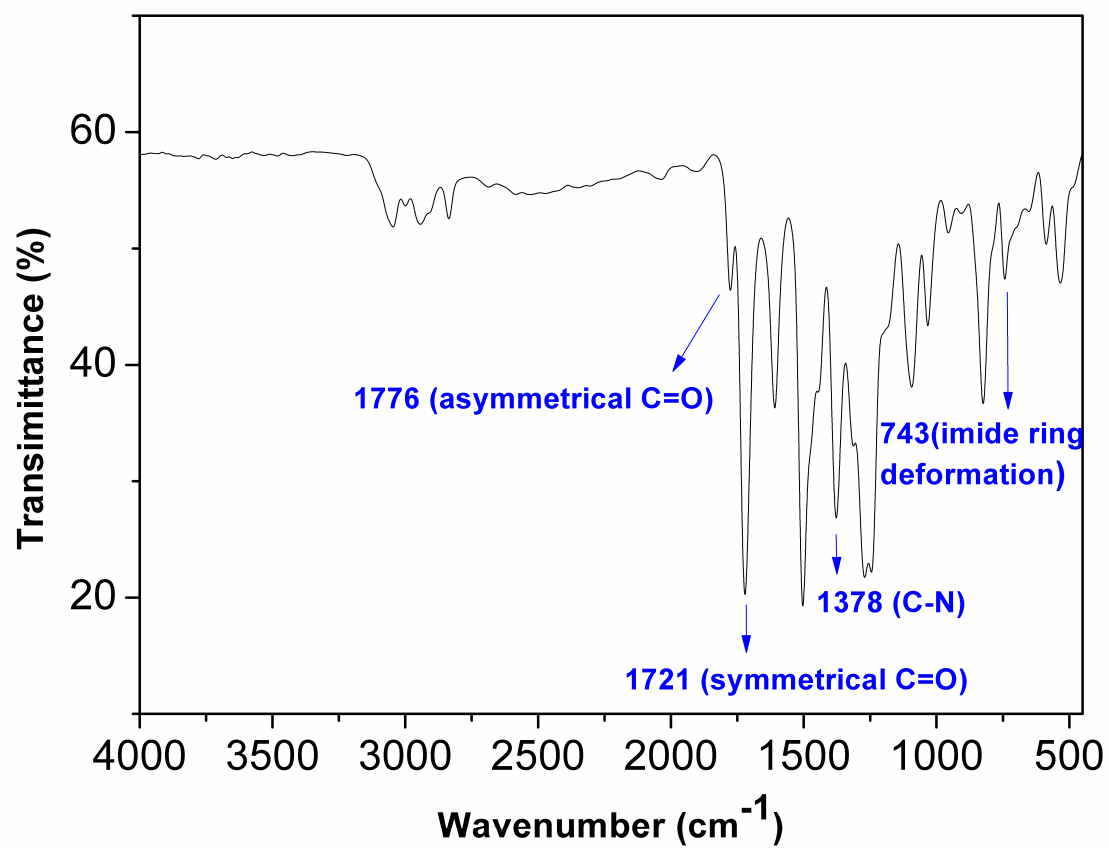


Figure S2. IR spectrum of polyimide (OMe)₂TPPA-ODPI film.

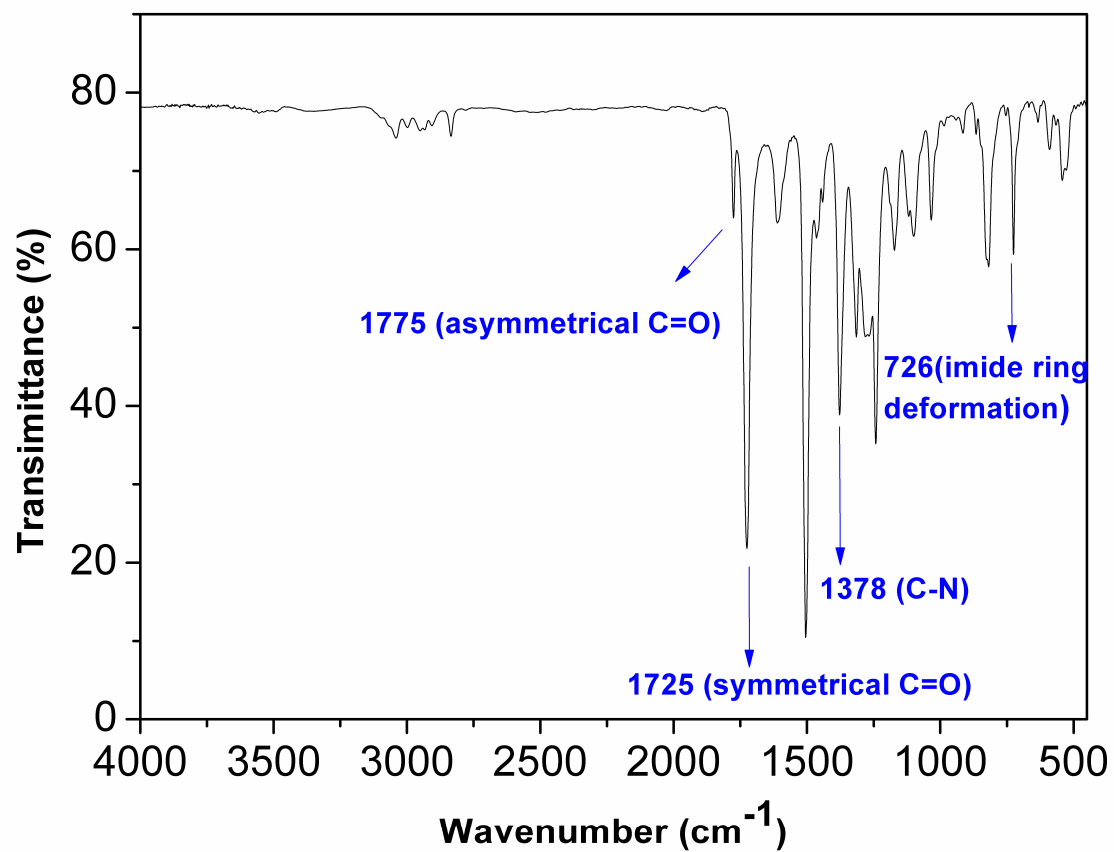


Figure S3. IR spectrum of polyimide (OMe)₂TPPA-PMPI film.

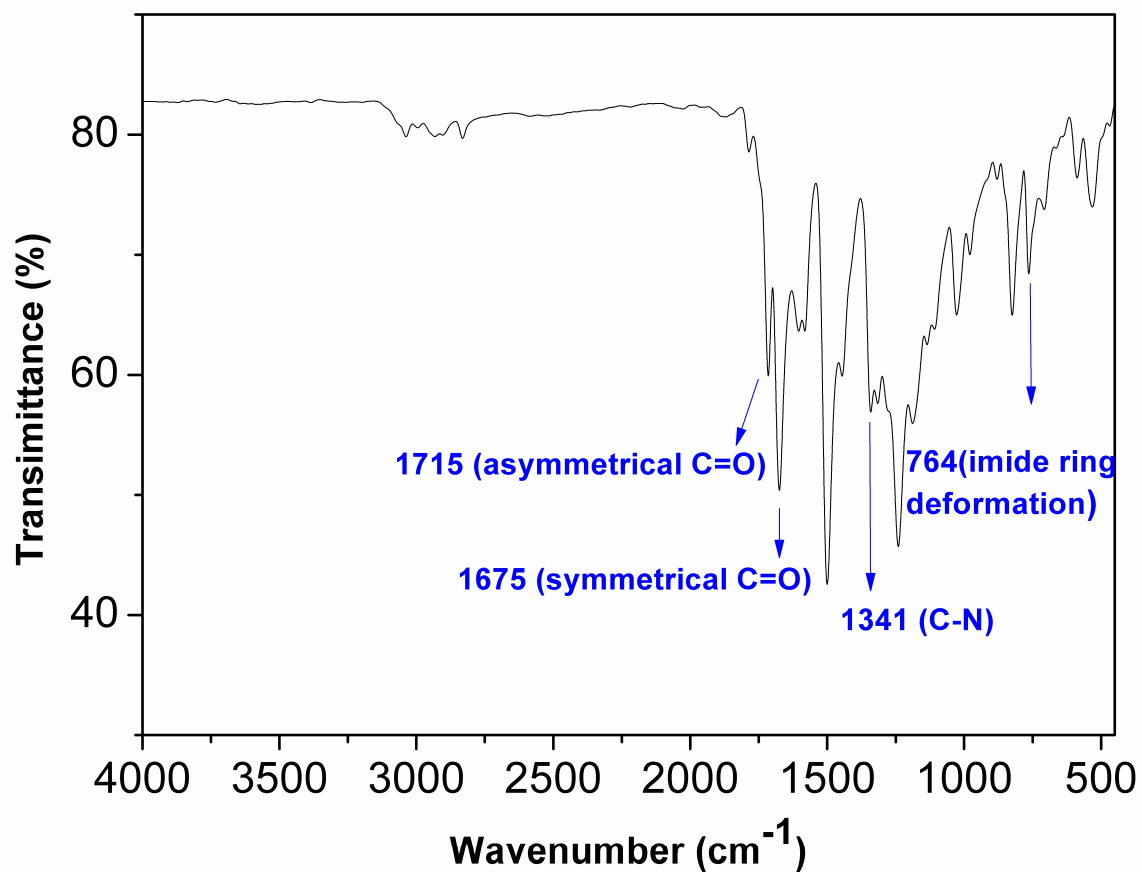


Figure S4. IR spectrum of polyimide (OMe)₂TPPA-NPPI film.

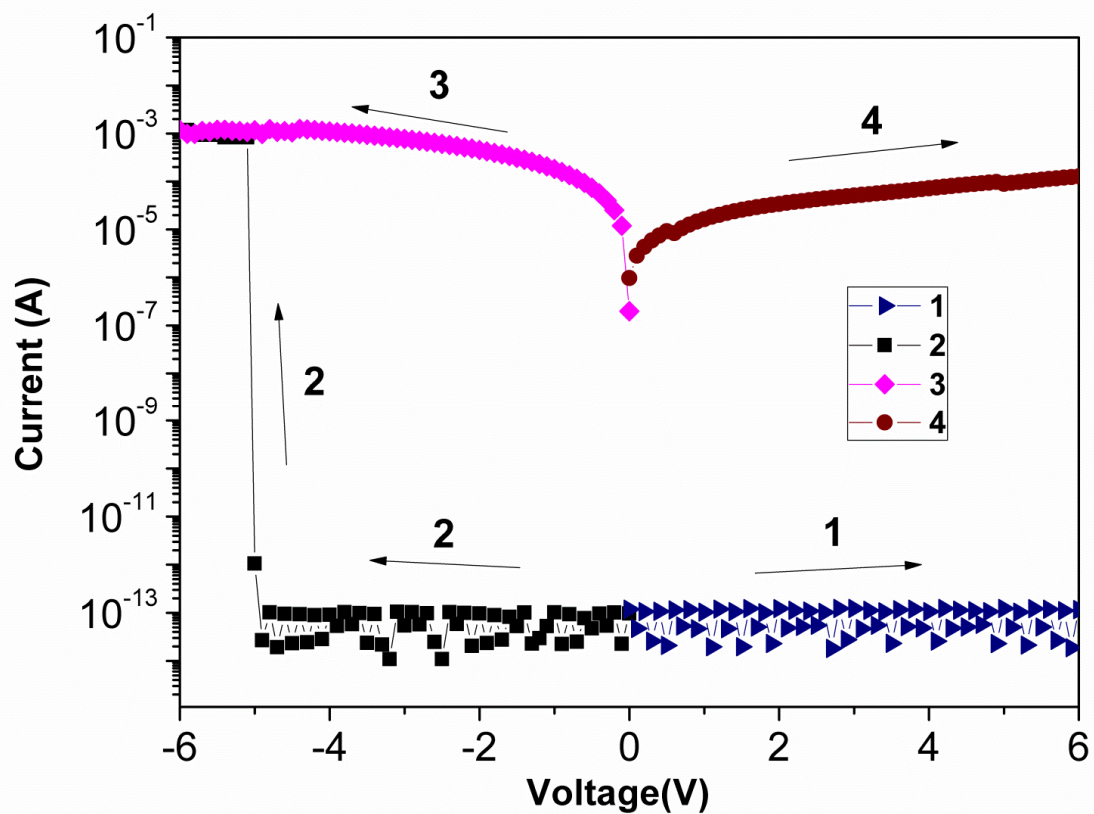


Figure S5. Current-voltage (I-V) characteristics of the ITO/DSPI (54 ± 3 nm)/Al memory device. (DSPI was prepared by thermal imidization)

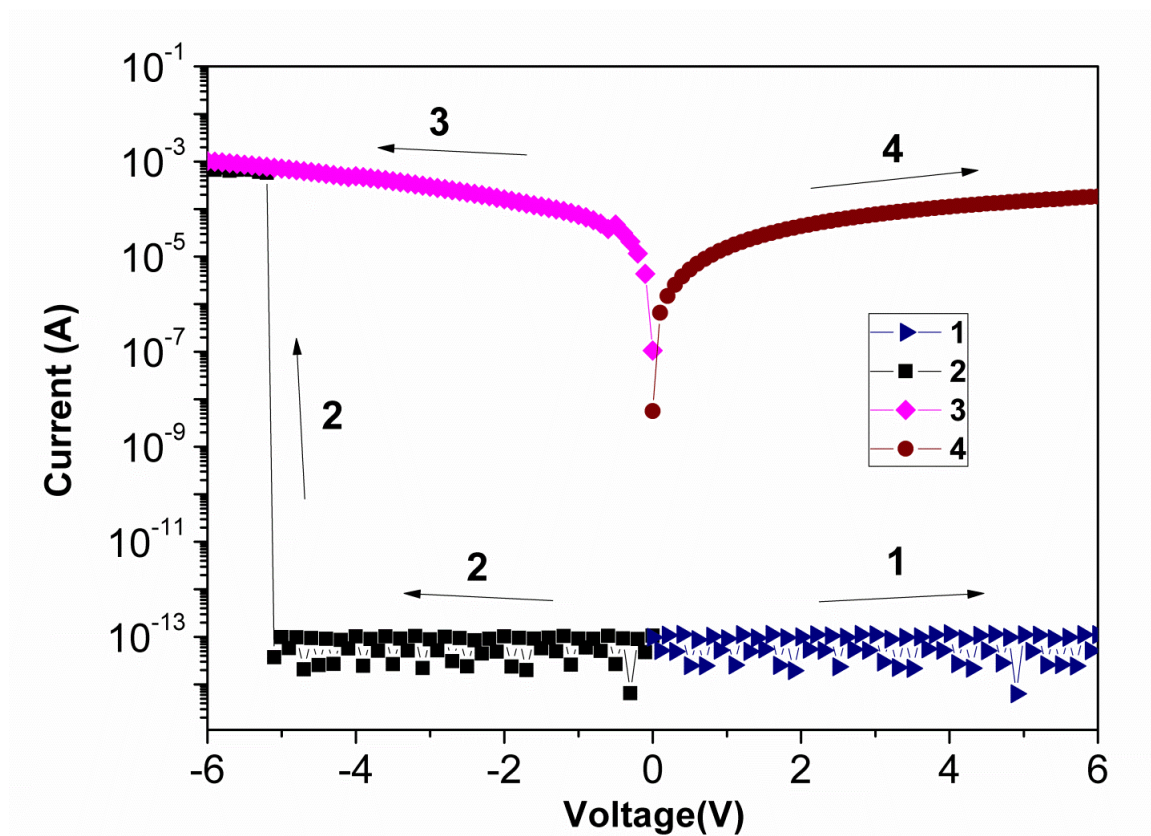


Figure S6. Current-voltage (I-V) characteristics of the ITO/DSPI (51 ± 2 nm)/Al memory device. (DSPI was prepared by chemical imidization, coated on ITO glass and treated at 100°C for 1h, 200°C for 1h and 300°C for 1h)

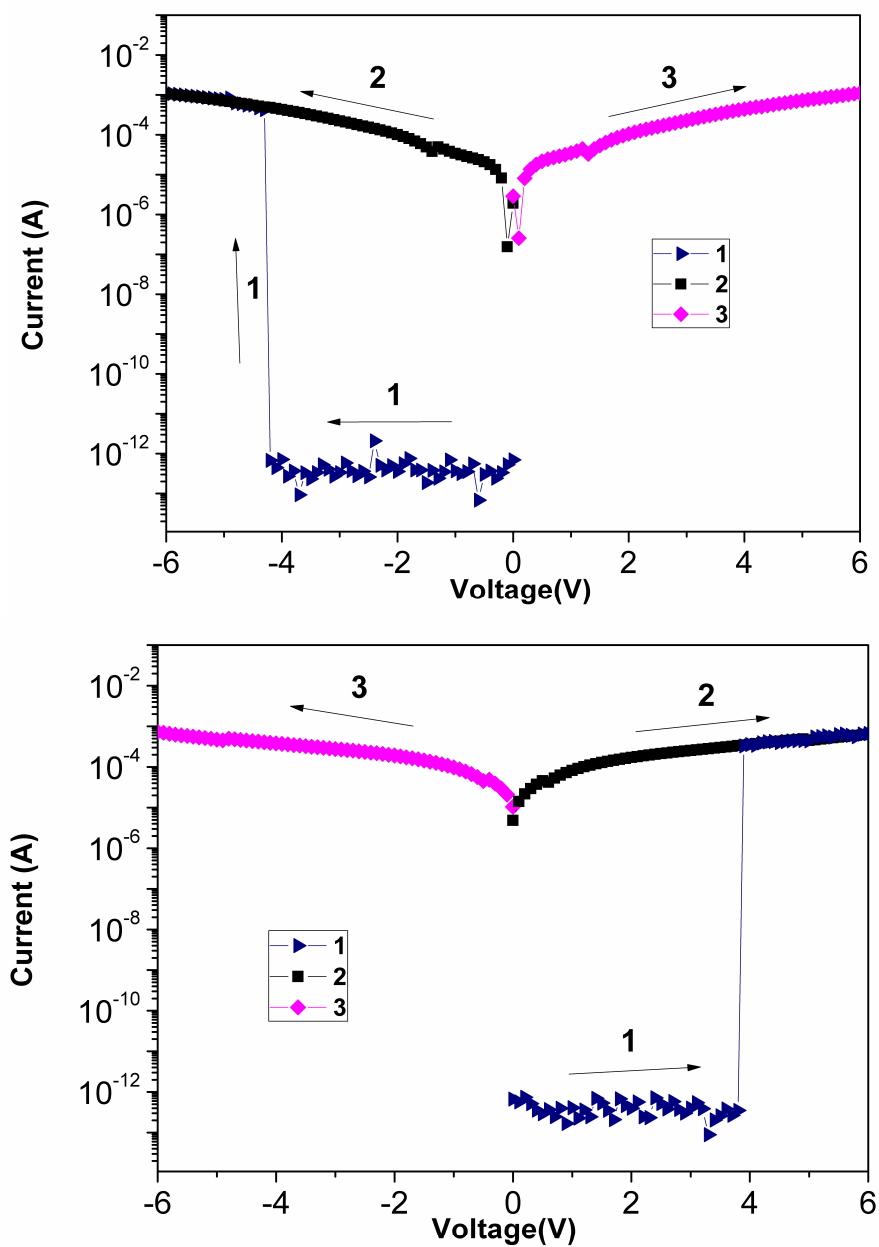


Figure S7. Current-voltage (I-V) characteristics of the Au/DSPI (51 ± 2 nm)/Au memory device.

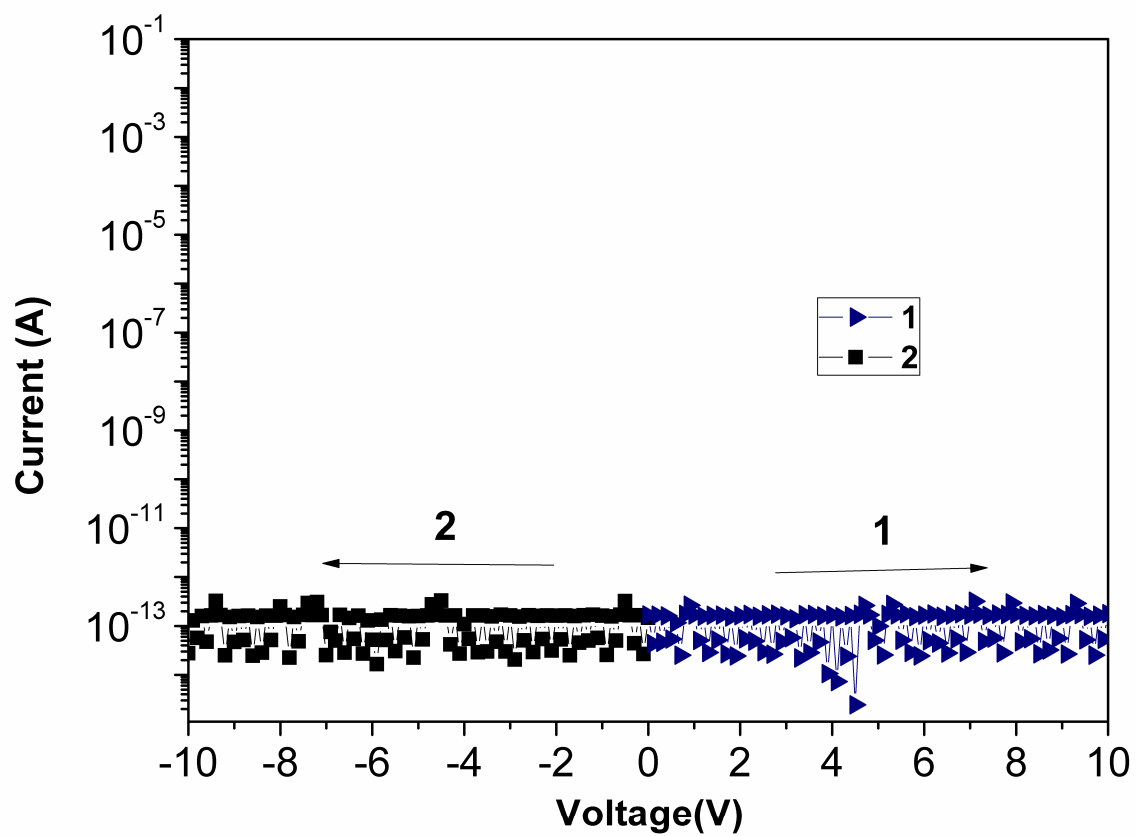


Figure S8. Current-voltage (I-V) characteristics of the ITO/ODPI (50 ± 2 nm)/Al memory device.