

## Supporting Information

### Electrically Programmable Digital Memory Behaviors Based on Novel Functional Aromatic Polyimide/TiO<sub>2</sub> Hybrids with High ON/OFF Ratio

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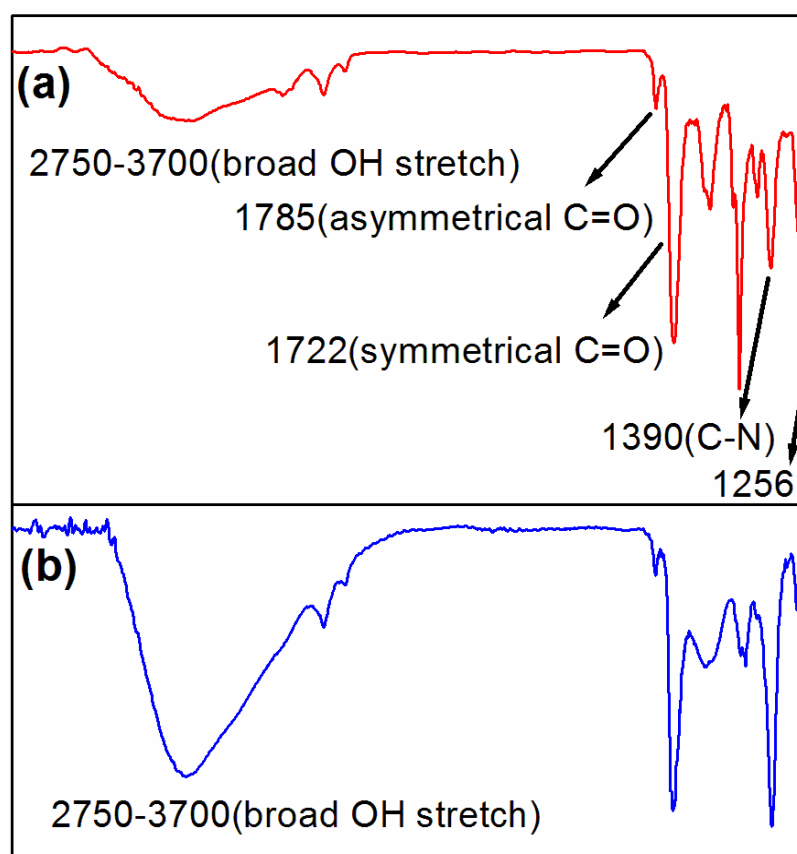
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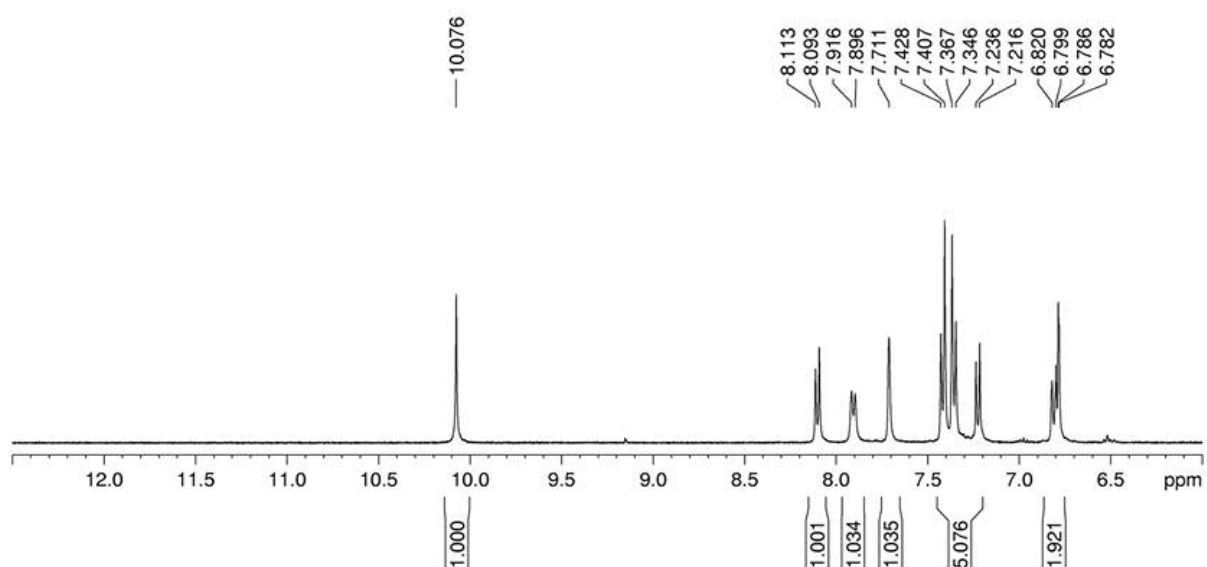
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**Figure S1.** IR spectra of the studied films (a) 3SOH-6FPI and (b) 3STP-50.



**Figure S2.**  $^1\text{H}$  NMR spectrum of polyimide **3SOH-6FPI**.

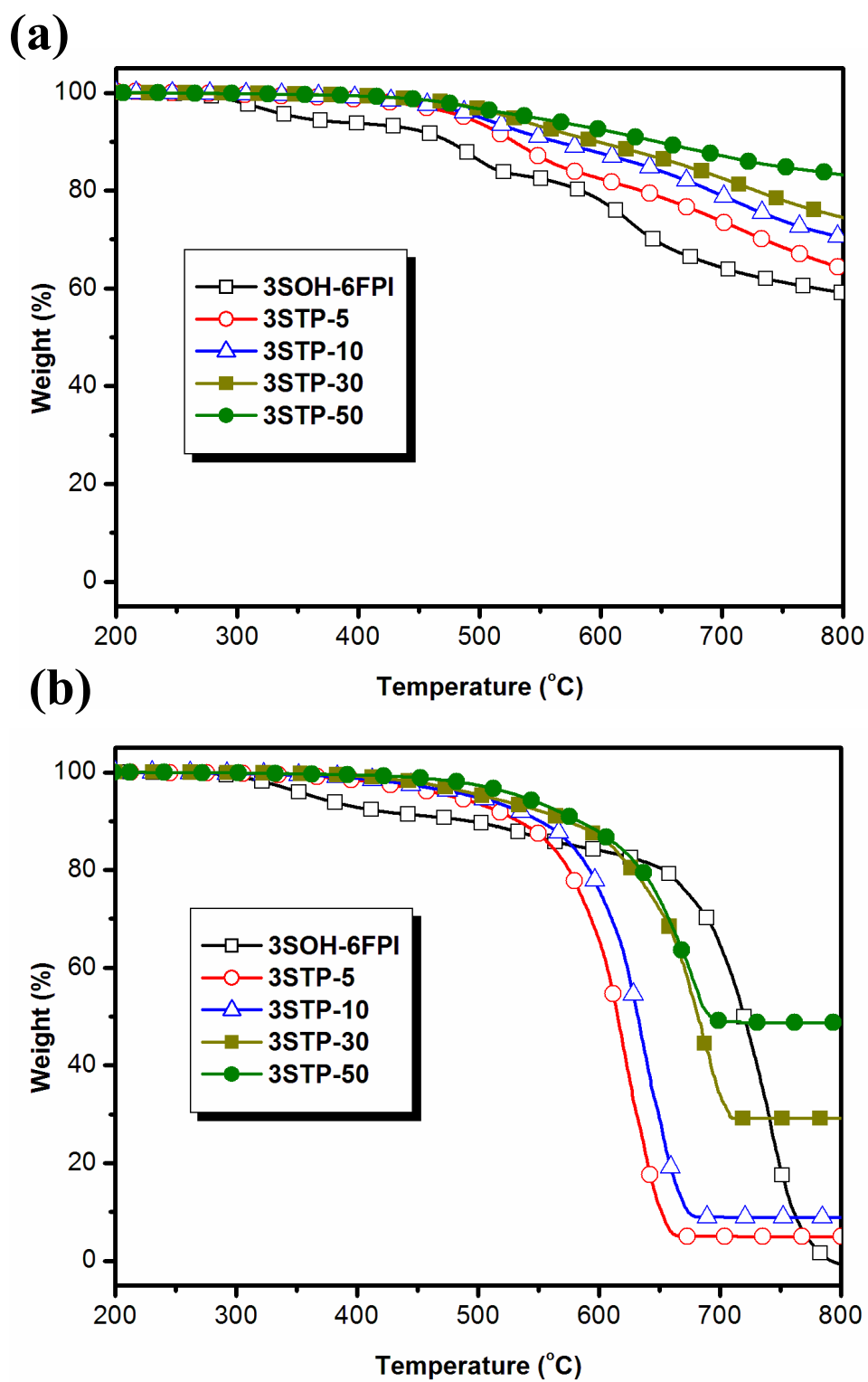


Figure S3. TGA thermograms of 3SOH-6FPI hybrid materials (a) in N<sub>2</sub> (b) in air.

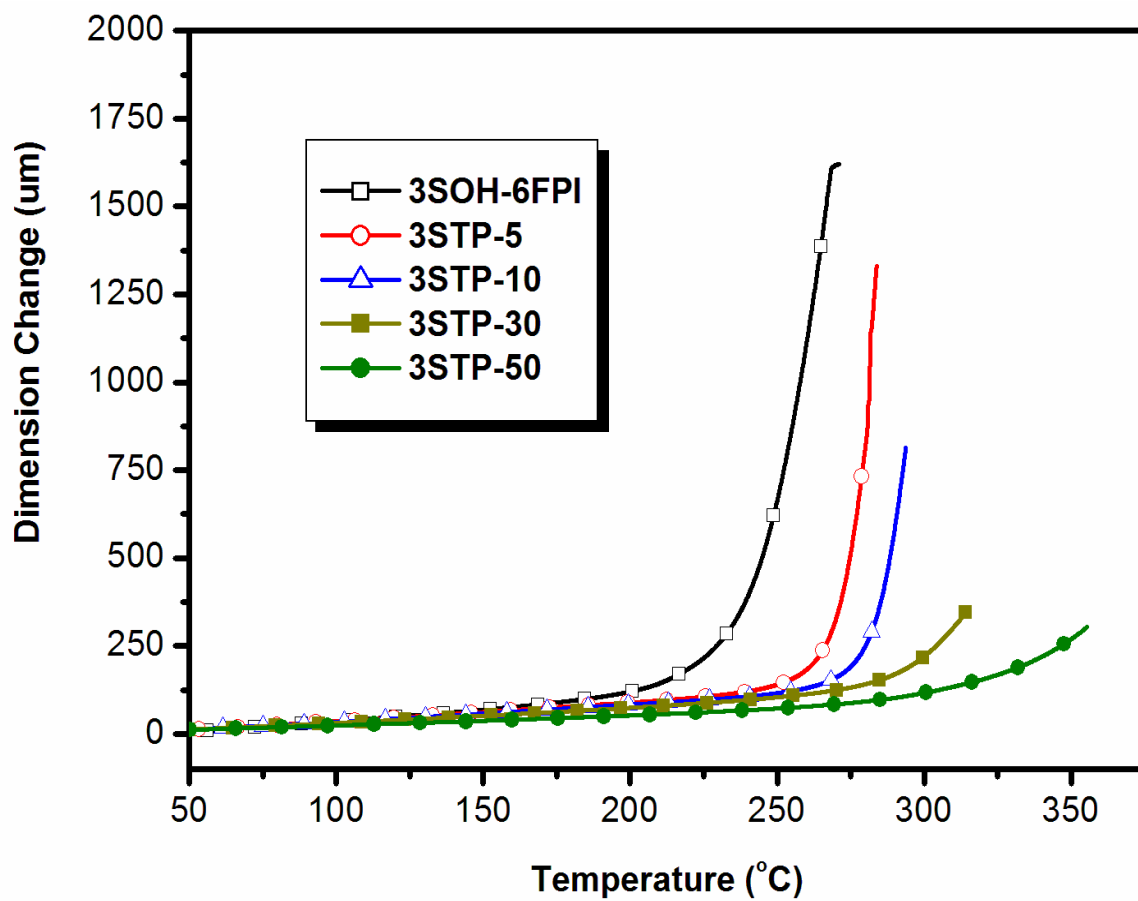
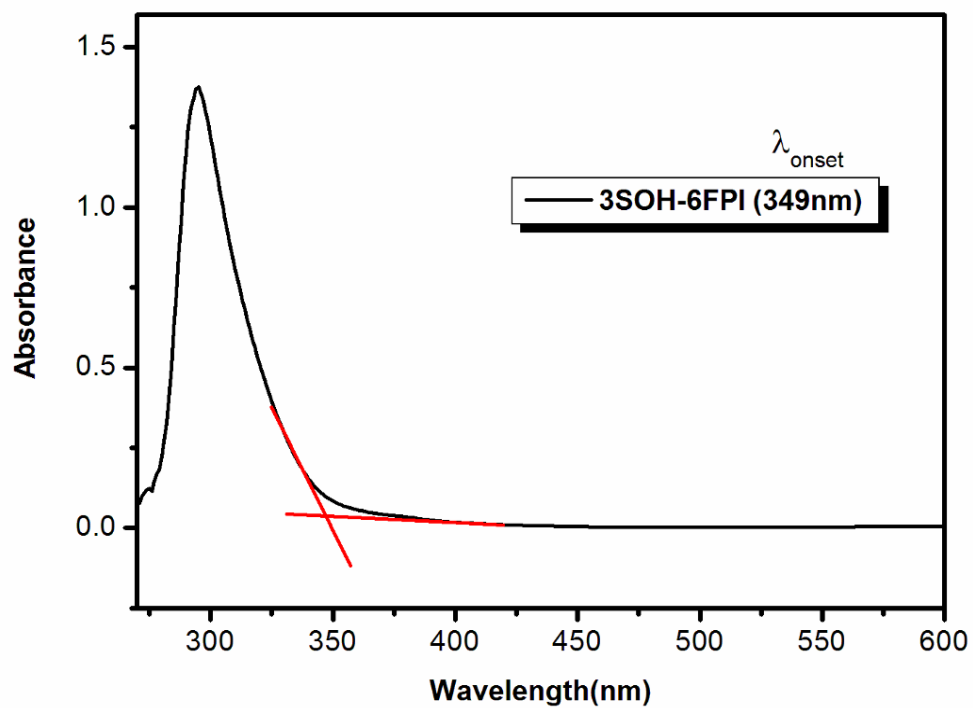
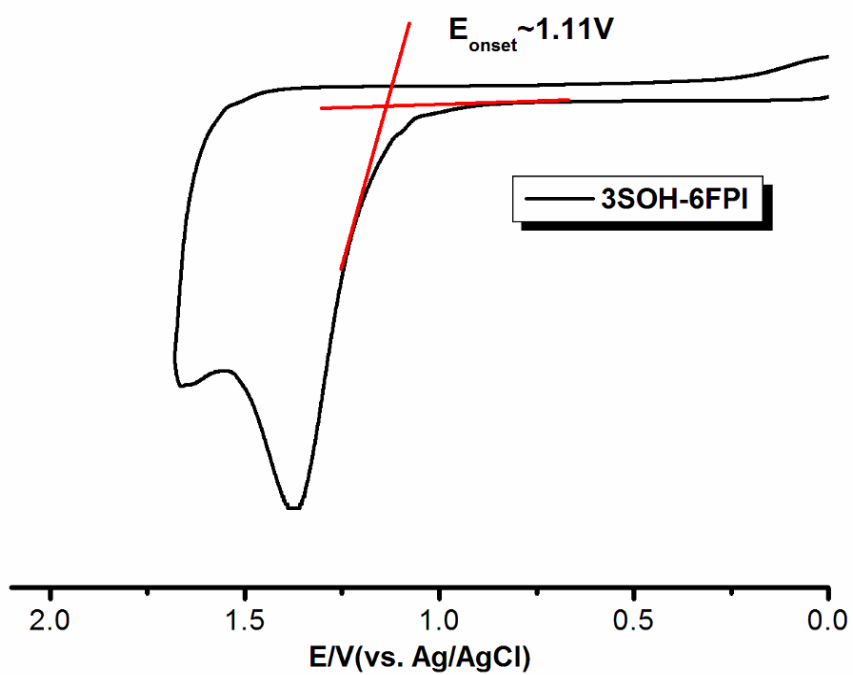


Figure S4. TMA thermogram of 3SOH-6FPI hybrid materials.



**Figure S5.** UV-visible absorption spectrum of 3SOH-6FPI.



**Figure S6.** Cyclic voltammogram of 3SOH-6FPI film on an ITO-coated glass substrate over cyclic scan.

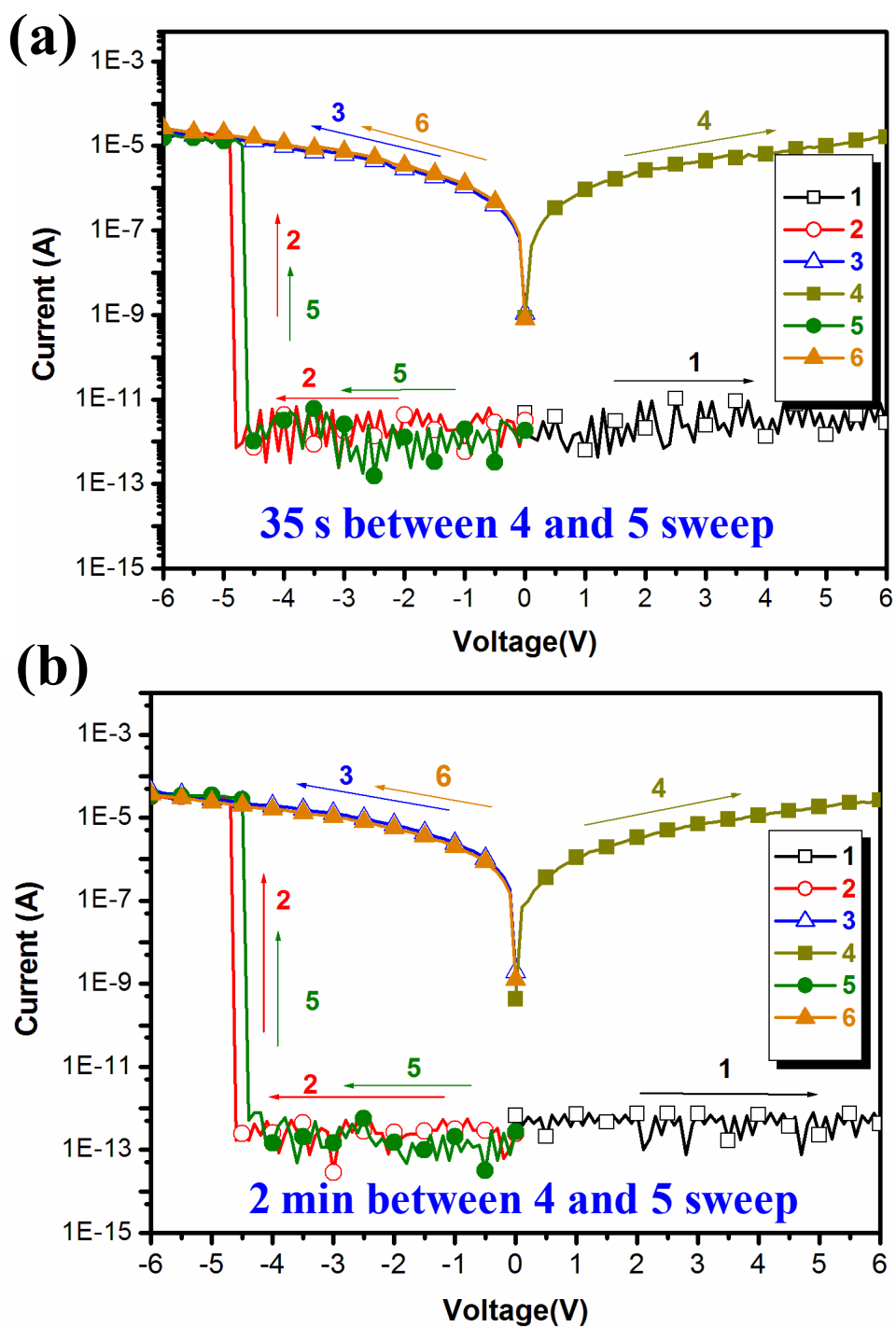
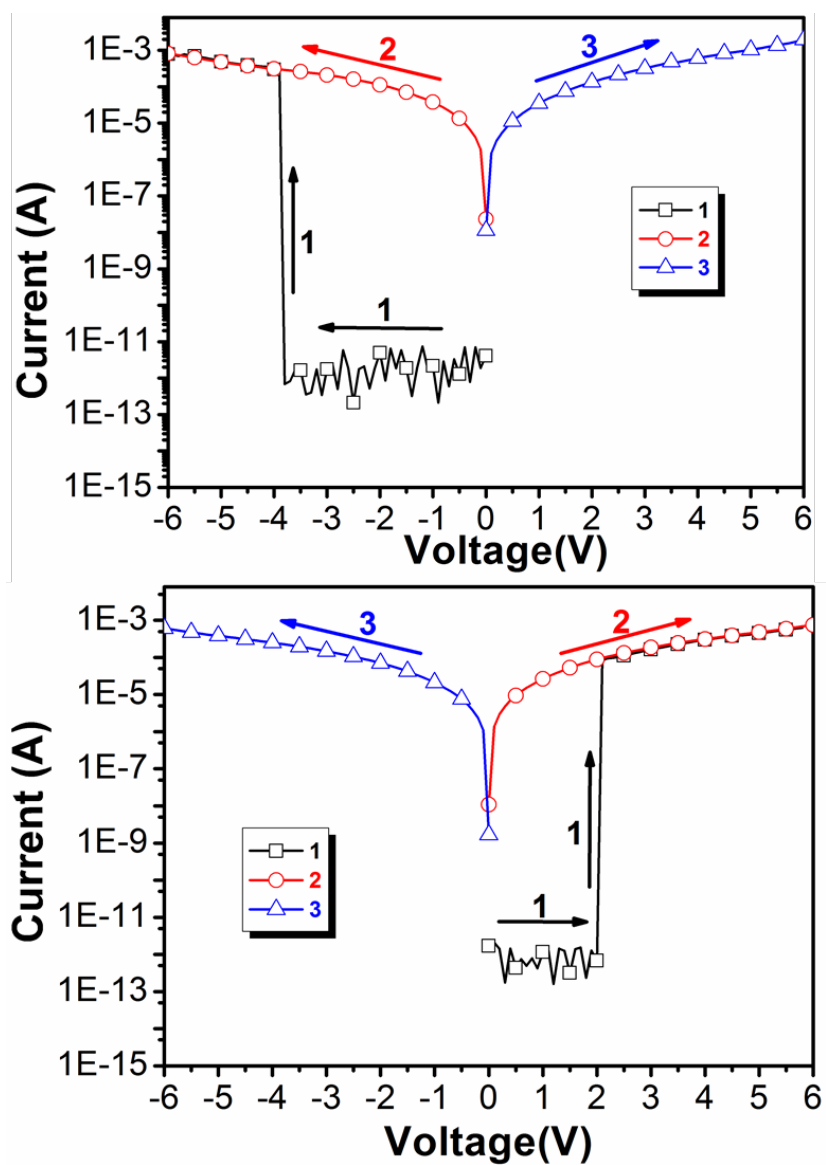


Figure S7. Current-voltage (I-V) characteristics of the ITO/3STP-5/Al memory device.





**Figure S8.** Current-voltage (I-V) characteristics of the ITO/3STP-50/Al memory device.

**Table S1.** Inherent Viscosities and GPC Data of **3SOH-6FPI**.

Polymer	$\eta_{\text{inh}}^a$ (dL/g)	$M_w^b$	$M_n^b$	PDI <sup>c</sup>
<b>3SOH-6FPI</b>	0.49	103200	52800	1.95

<sup>a</sup> Measured at a polymer concentration of 0.5 g/dL in DMAc at 30 °C.

<sup>b</sup> Calibrated with polystyrene standards, using NMP as the eluent at a constant flow rate of 0.5 mL/min at 40 °C.

<sup>c</sup> Polydispersity index ( $M_w/M_n$ ).

**Table S2.** Solubility<sup>a</sup> of **3SOH-6FPI**.

Polymer	Solvents						
	NMP	DMAc	DMF	DMSO	<i>m</i> -cresol	THF	CHCl <sub>3</sub>
<b>3SOH-6FPI</b>	++	++	++	++	++	++	—

<sup>a</sup> The qualitative solubility was tested with 10 mg of a sample in 1 mL of stirred solvent. (++) soluble at room temperature, (+) soluble on heating, (+—) partial soluble on heating, (—) insoluble even on heating.