

**SUPPLEMENTARY INFORMATION**

**Semi-conjugated Acceptor Based Polyimides as the Electrets for  
Nonvolatile Transistor Memory Devices**

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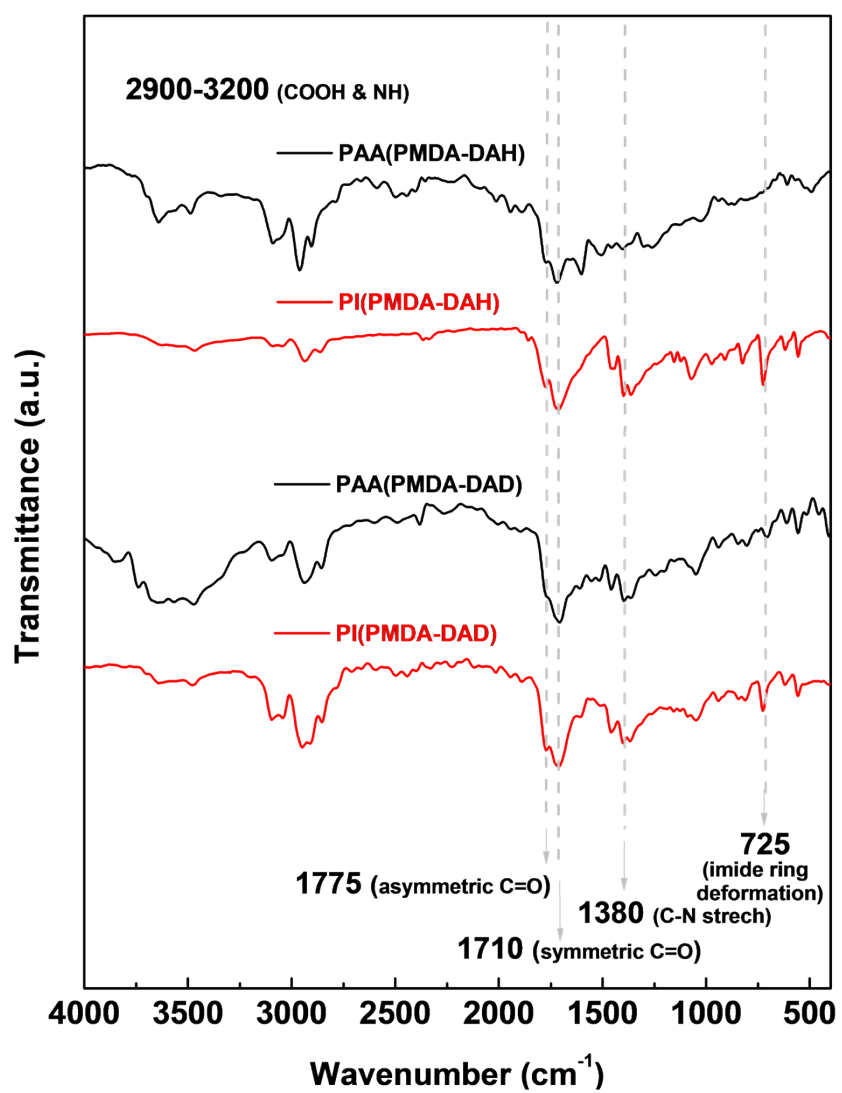
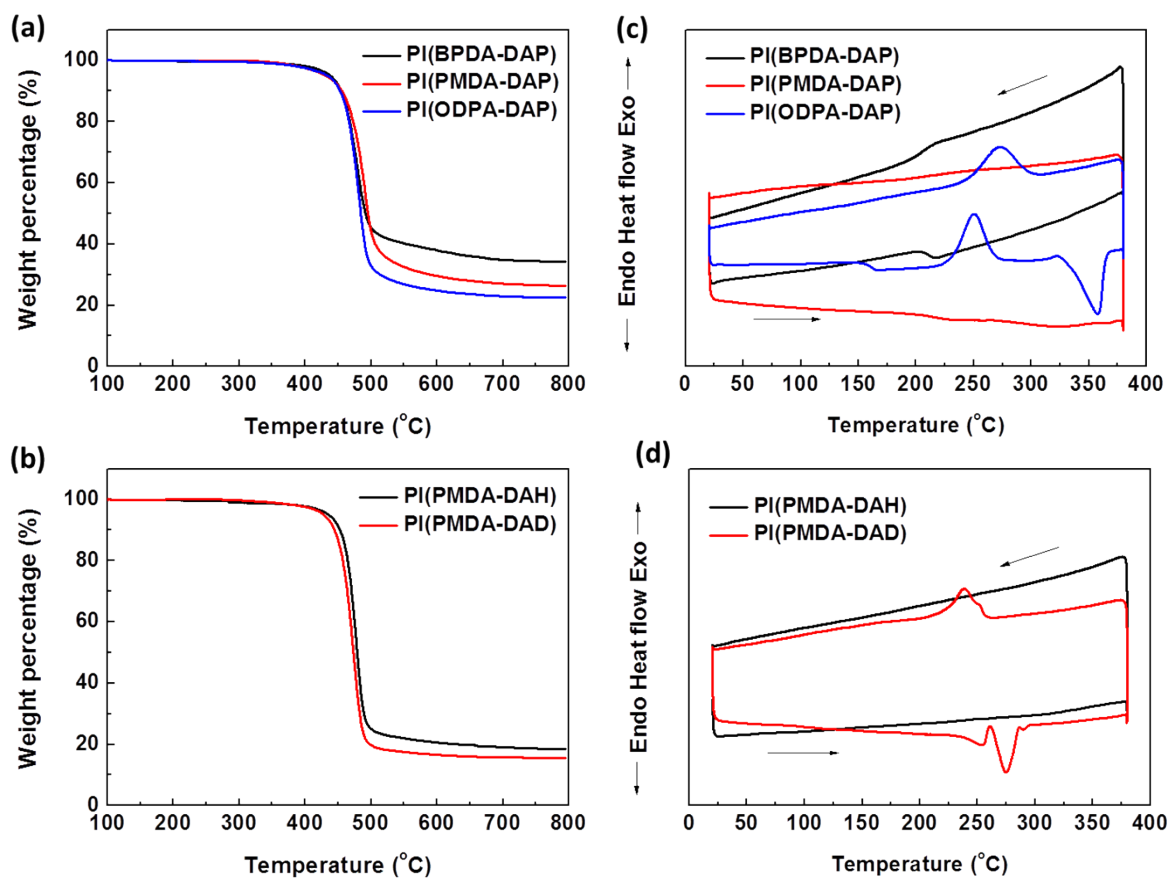
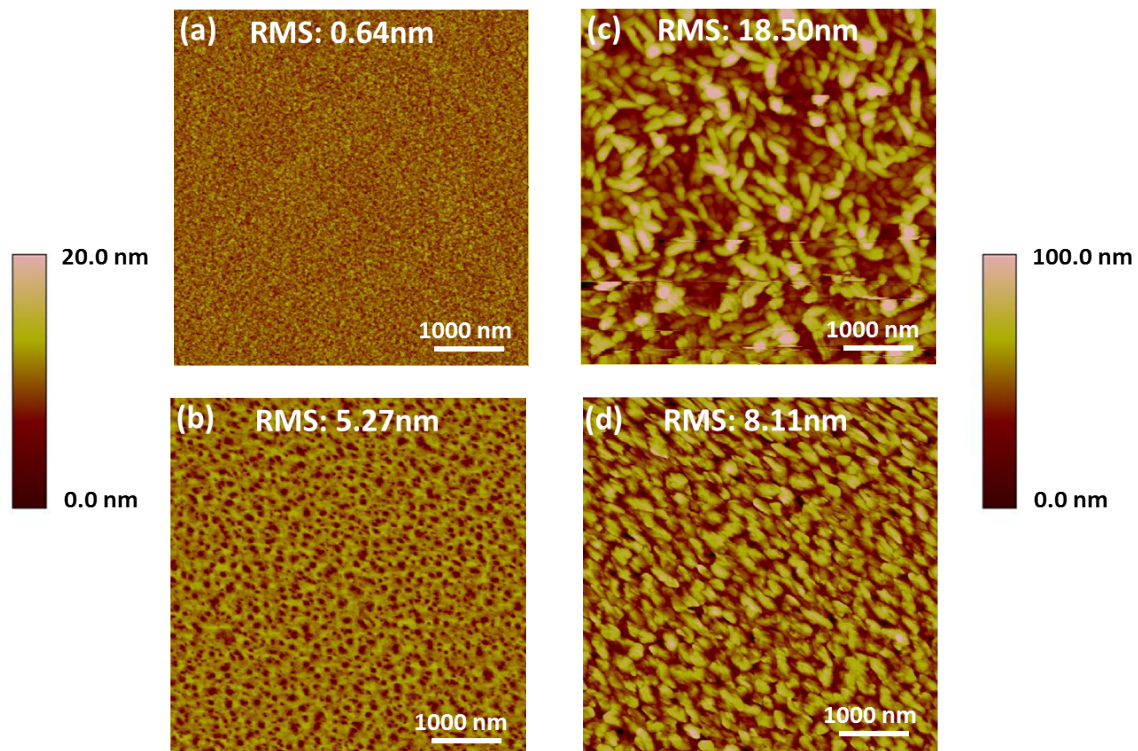


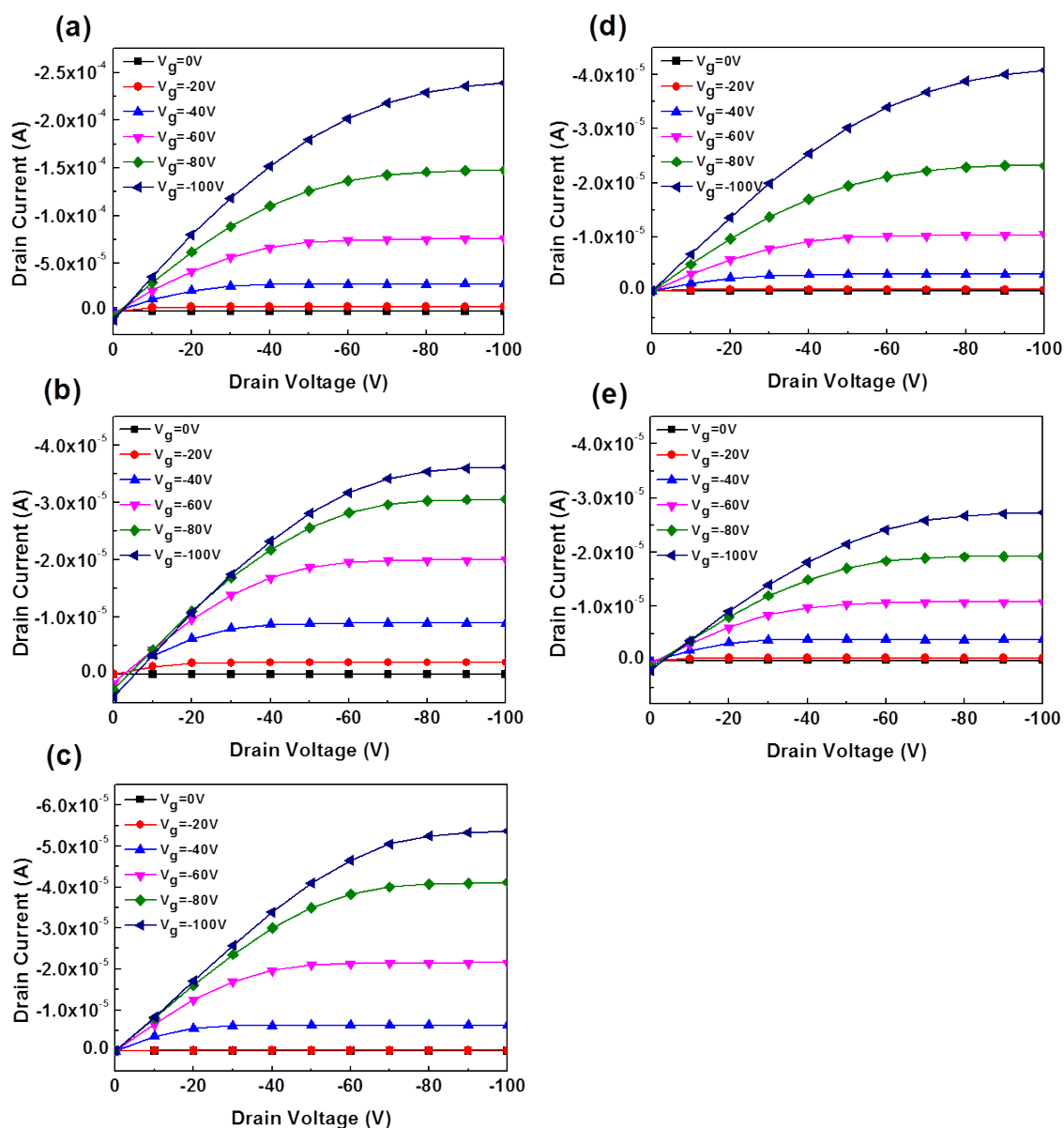
Figure S1. IR spectra of the targeted poly(amic acids) and PI(PMDA-DAH) and PI(PMDA-DAD).



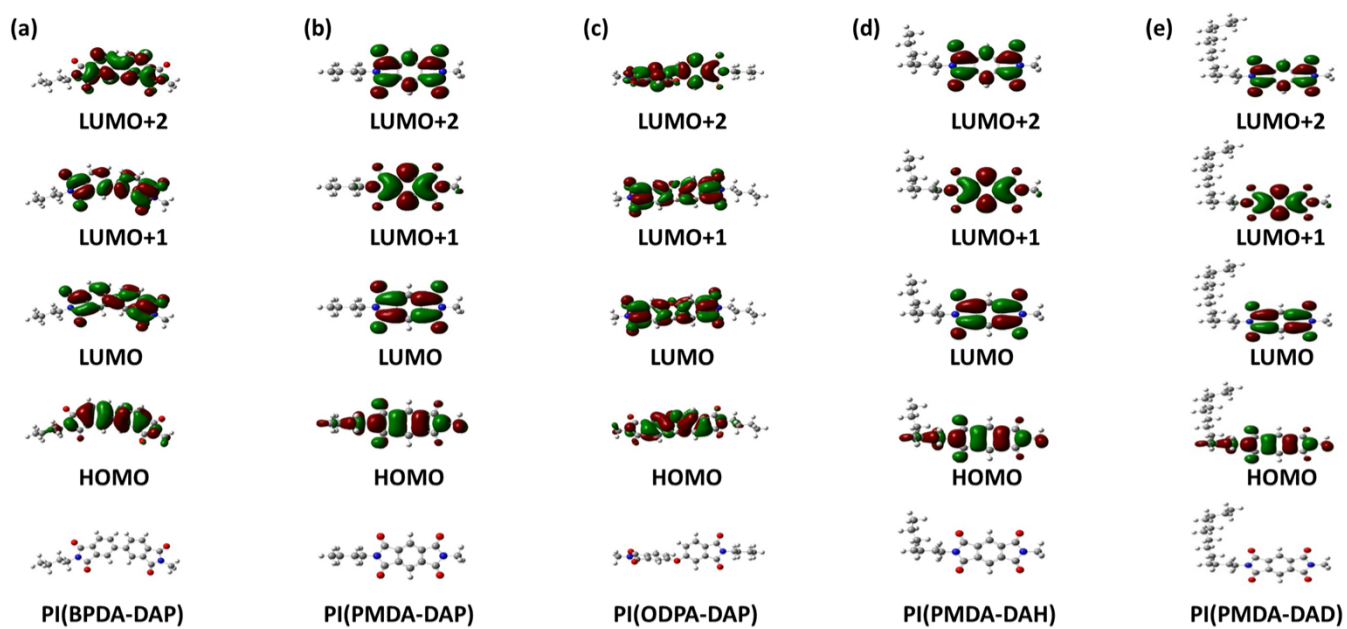
**Figure S2.** (a)-(b) TGA and (c)-(d) DSC curves of the studied PIs at a heating rate of 10°C/min and 5°C/min under nitrogen atmosphere, respectively.



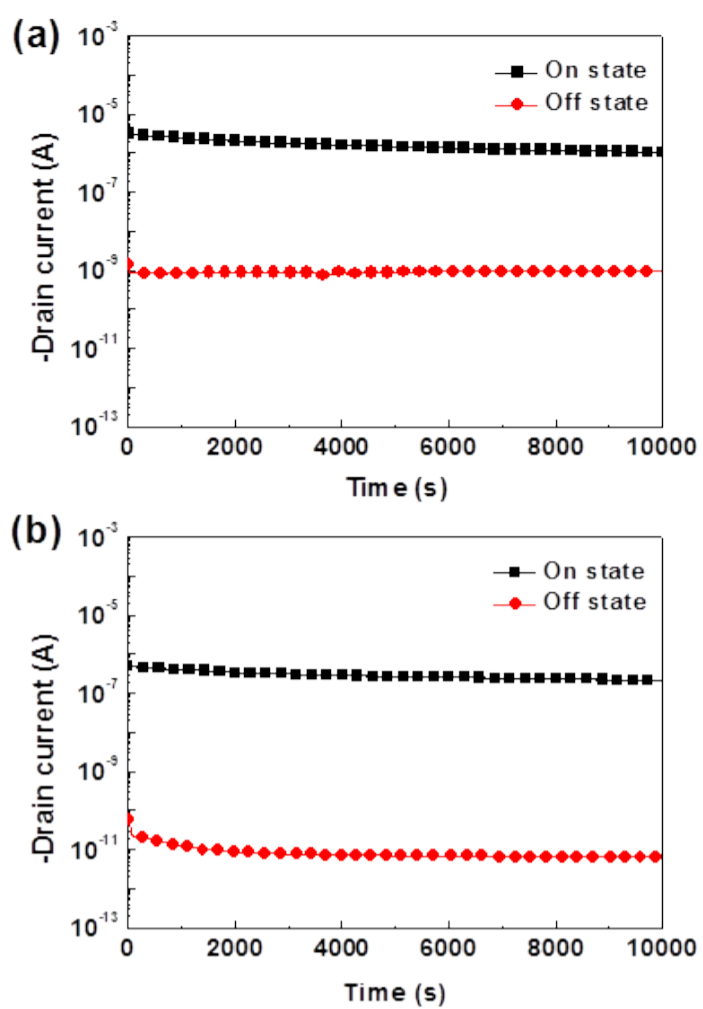
**Figure S3.** AFM topographic surface images of (a) **PI(PMDA-DAH)** and (b) **PI(PMDA-DAD)** on bare SiO<sub>2</sub> substrates and the atop pentacene on (c) **PI(PMDA-DAH)** and (d) **PI(PMDA-DAD)**.



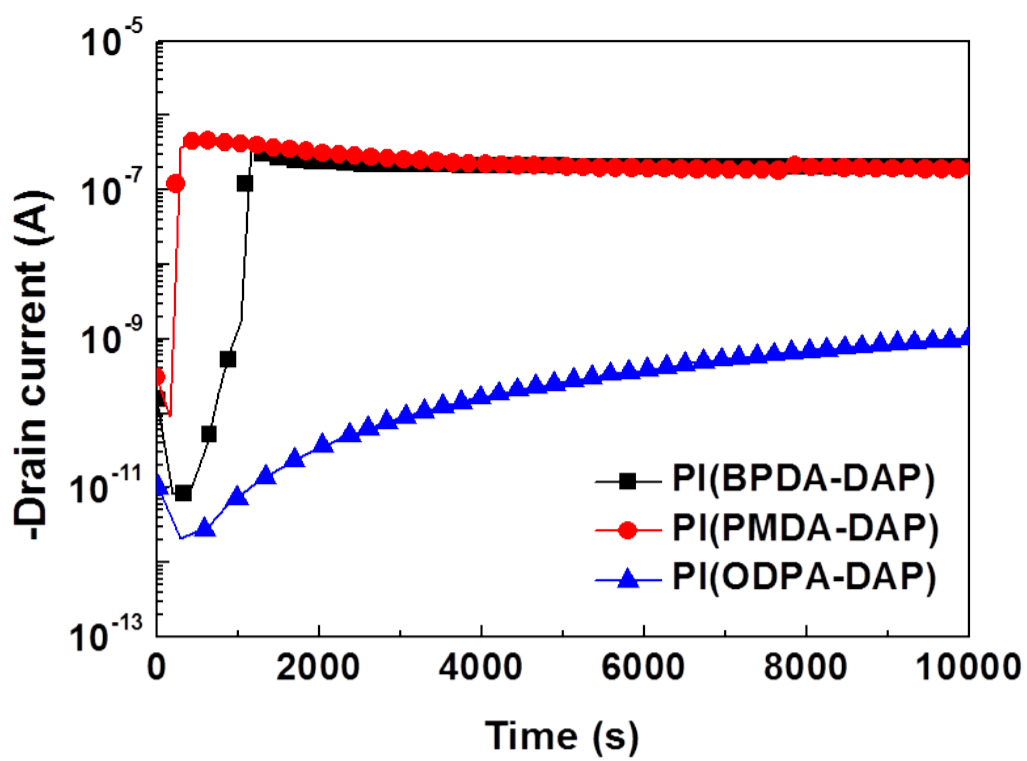
**Figure S4.** Output characteristics of the OFET devices with the PI electrets of (a) PI(BPDA-DAP), (b) PI(PMDA-DAP), (c) PI(ODPA-DAP), (d) PI(PMDA-DAH), and (e) PI(PMDA-DAD).



**Figure S5.** Molecular orbitals of (a) **PI(BPDA-DAP)** , (b) **PI(PMDA-DAP)** , (c) **PI(ODPA-DAP)** , (d) **PI(PMDA-DAH)** and (e) **PI(PMDA-DAD)**.

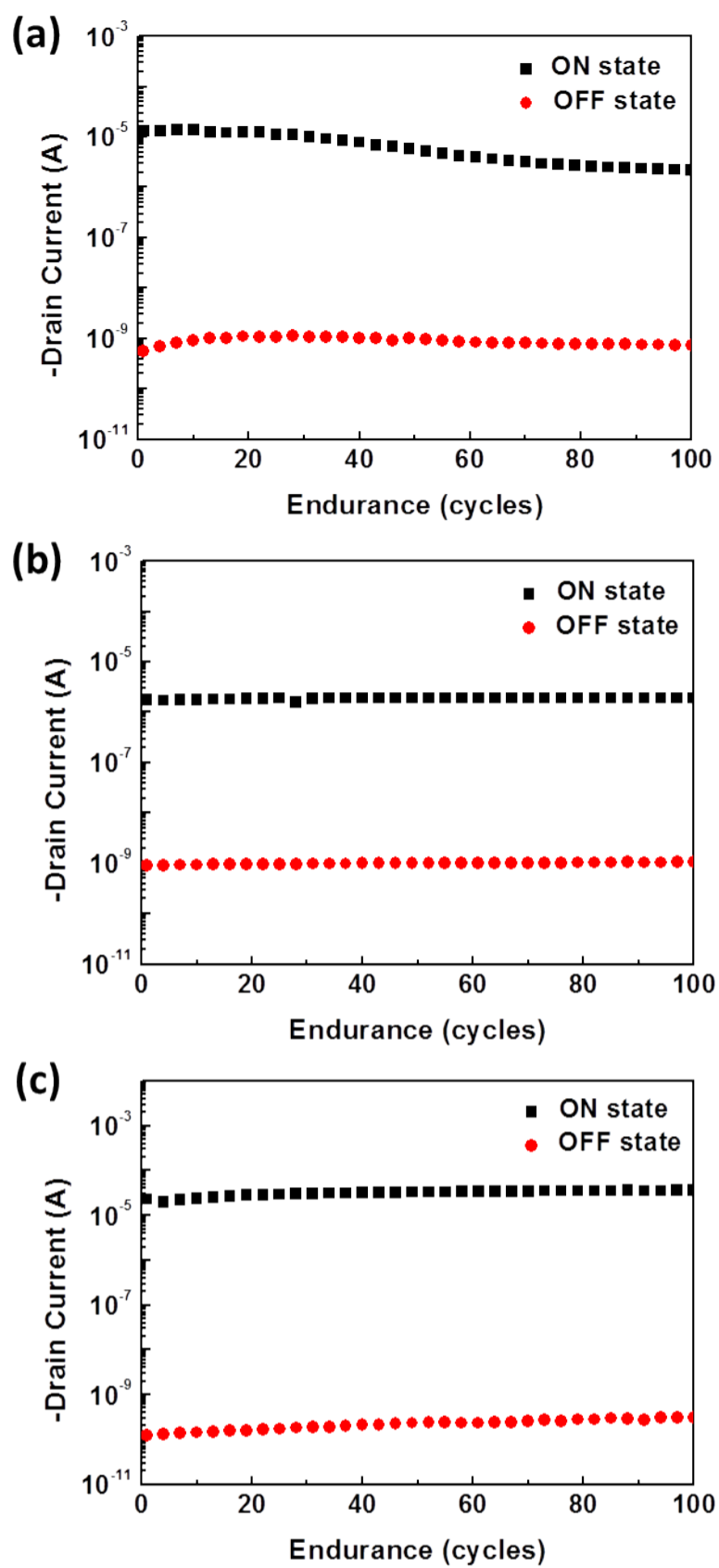


**Figure S6.** Retention time of the pentacene OFET memory devices with (a) PI(PMDA-DAH) and (b) PI(PMDA-DAD) as electrets at  $V_g = 0V$ .



**Figure S7.** Retention time testing of the OFET memory devices based upon pentacene thin film with **PI(BPDA-DAP)**, **PI(PMDA-DAP)** and **PI(ODPA-DAP)** as electrets at the gate voltage of 15V within  $10^4$  s.





**Figure S8.** Endurance of the memory devices with (a) **PI(BPDA-DAP)**, (b) **PI(PMDA-DAP)**, and (c) **PI(ODPA-DAP)** as electrets.