

# Enhancement of stability in *n*-channel OFETs by modulating polymeric dielectric

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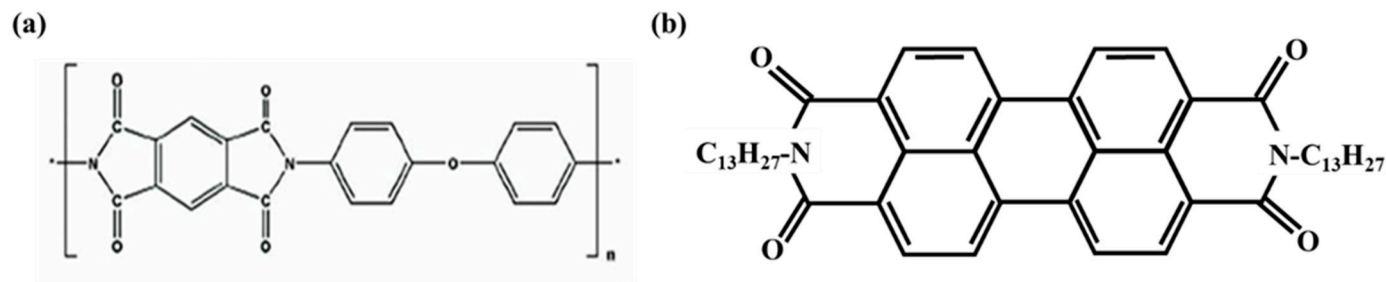
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**Table S1.** Performance criteria of OFETs with different dielectrics (averaging by 10 devices).

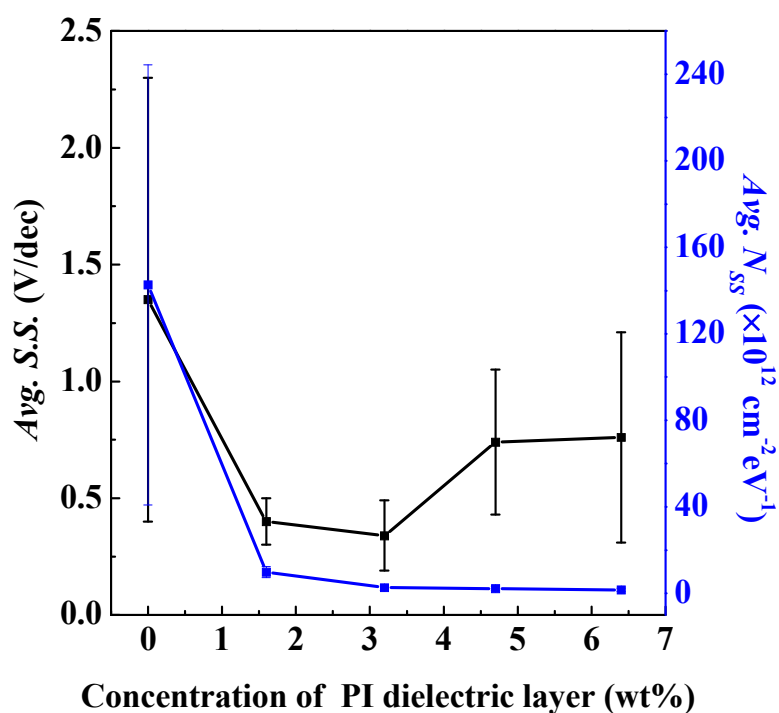
Dielectric of OFETs	$V_{th}$ (V)	$I_{On} / I_{Off}$ Ratio	$S.S.$ (V/dec)	Mobility ( $\text{cm}^2/Vs$ )
PI (6.4 wt%) /AlO <sub>x</sub>	$-0.83 \pm 0.41$	$(3.8 \pm 3.4) \times 10^3$	$0.76 \pm 0.45$	$(2.5 \pm 1.7) \times 10^{-3}$
PI (4.7 wt%) /AlO <sub>x</sub>	$-0.26 \pm 0.16$	$(1.5 \pm 1.2) \times 10^4$	$0.74 \pm 0.31$	$(2.3 \pm 1.4) \times 10^{-3}$
PI (3.2 wt%) /AlO <sub>x</sub>	$0.16 \pm 0.12$	$(2.5 \pm 2.4) \times 10^4$	$0.34 \pm 0.15$	$(1.0 \pm 0.7) \times 10^{-2}$
PI (1.6 wt%) /AlO <sub>x</sub>	$0.13 \pm 0.09$	$(1.3 \pm 1.0) \times 10^4$	$0.40 \pm 0.10$	$(1.6 \pm 1.1) \times 10^{-2}$
AlO <sub>x</sub>	$0.15 \pm 0.04$	$(1.9 \pm 1.7) \times 10^2$	$1.35 \pm 0.95$	$(1.5 \pm 0.6) \times 10^{-4}$

**Table S2.** Comparison of mobilities between different references and this work.

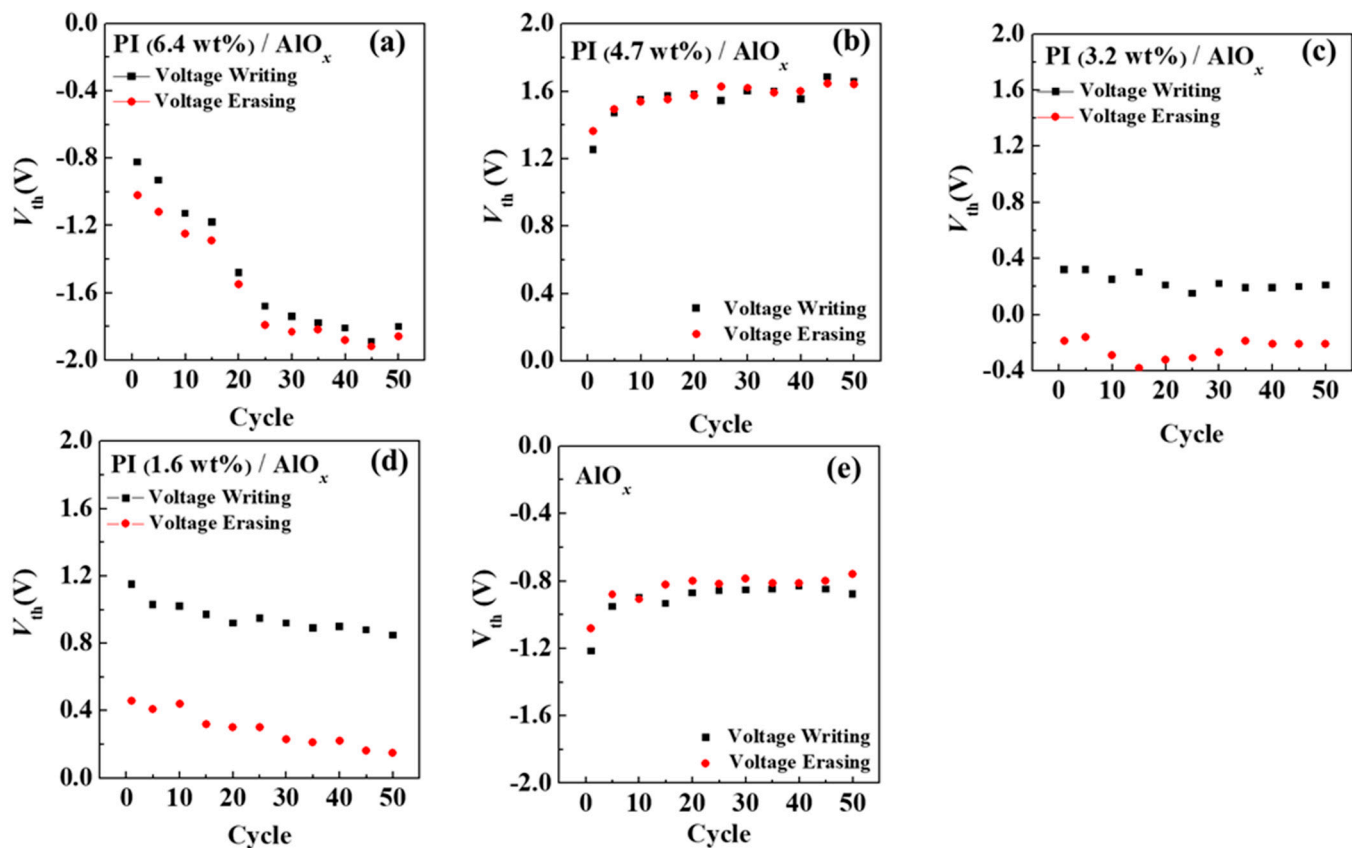
Semiconductor	Mobility ( $\text{cm}^2/Vs$ )	Ref.
[5] phenacene	$1.5 \times 10^{-3}$	35
P(NDI2OD-T <sub>2</sub> )	$3.4 \times 10^{-3}$	36
PTCDI-C <sub>13</sub>	$2.3 \times 10^{-2}$	37
C <sub>3</sub> F <sub>7</sub> CH <sub>2</sub> -PTCDI-(CN) <sub>2</sub>	$4.0 \times 10^{-2}$	38
PTCDI-C <sub>13</sub>	$1.4 \times 10^{-2}$	39
PTCDI-C <sub>13</sub>	$1.6 \times 10^{-2}$	40
PTCDI-C <sub>13</sub>	$2.7 \times 10^{-3}$	41
4Cl-PDI-3EG	$8.0 \times 10^{-4}$	42
PTCDI-C <sub>13</sub>	$1.5 \times 10^{-2}$	This work



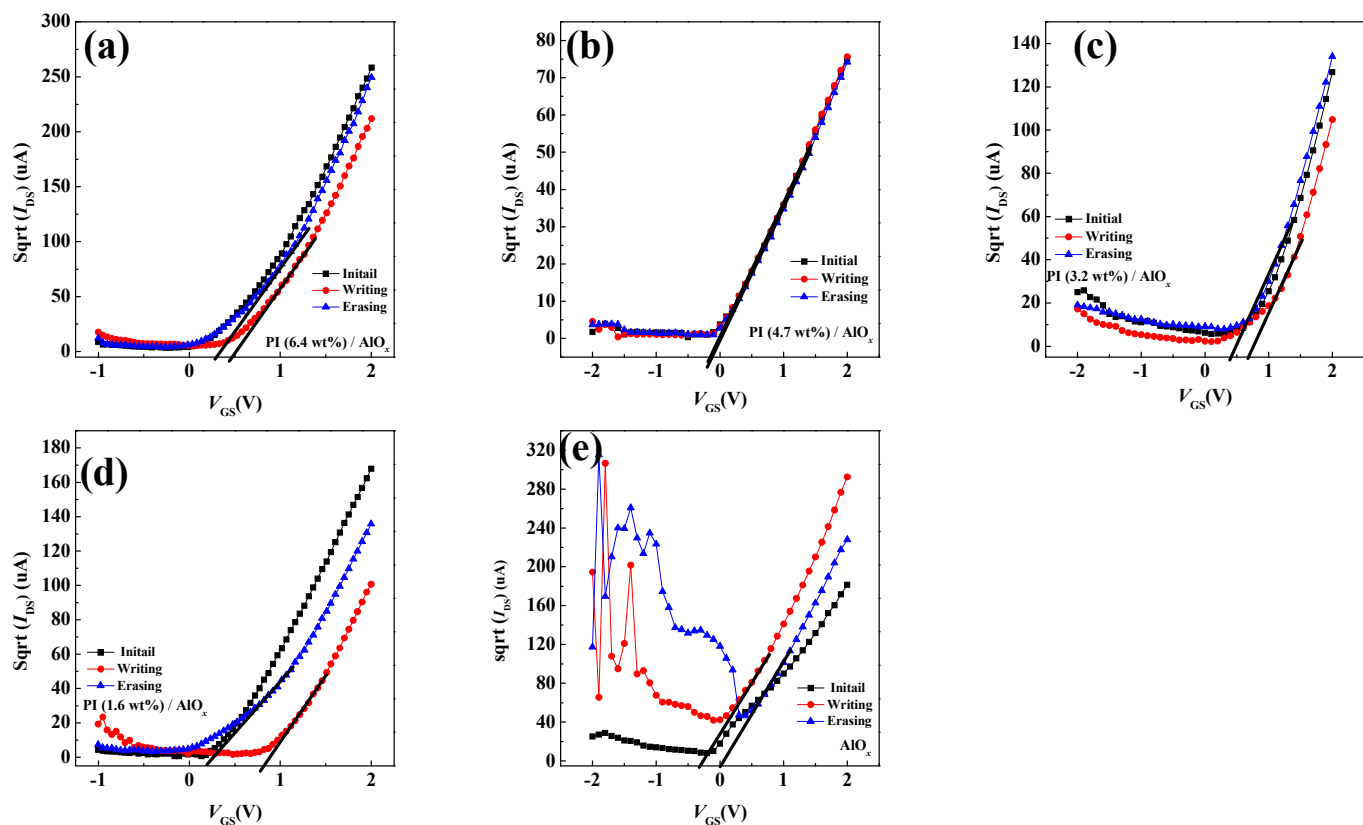
**Figure S1.** The chemical structures of (a) polymer dielectric material PI, and (b) organic semiconductor material PTCDI-C<sub>13</sub>.



**Figure S2.** The relationship between the  $S.S.$  and  $N_{ss}$  of the OFETs versus the different solid contents of the PI layer, in which 10 devices are used for averaging.



**Figure S3.** The  $V_{th}$  variation chart of writing-erasing for organic memory devices fabricated by using PI films with different solid contents (a) 6.4 wt%, (b) 4.7 wt%, (c) 3.2 wt%, (d) 1.6 wt%, and (e) native  $AlO_x$ .



**Figure S4.** The memory characteristics chart of writing-erasing behaviors for organic memory devices fabricated by using PI films with different solid contents (a) 6.4 wt%, (b) 4.7 wt%, (c) 3.2 wt%, (d) 1.6 wt%,

and (e) native  $\text{AlO}_x$ .