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Supporting Information

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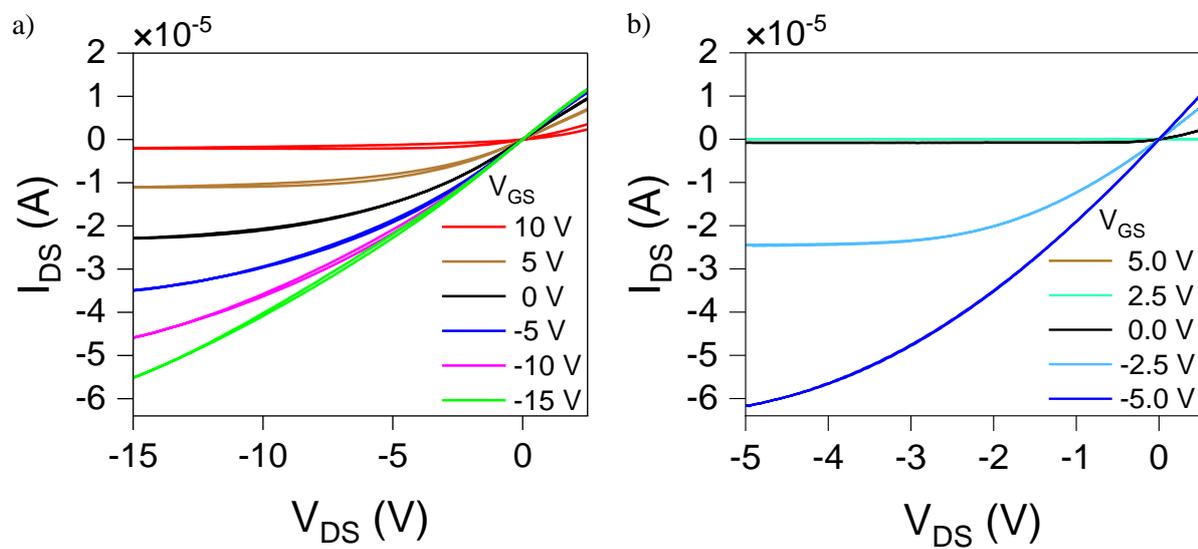


Figure S1. Output characteristics of two representative OFETs: (a) TMTES pristine and (b) TMTES blended with 33% PS (280 kDa) content.

PS content (%)

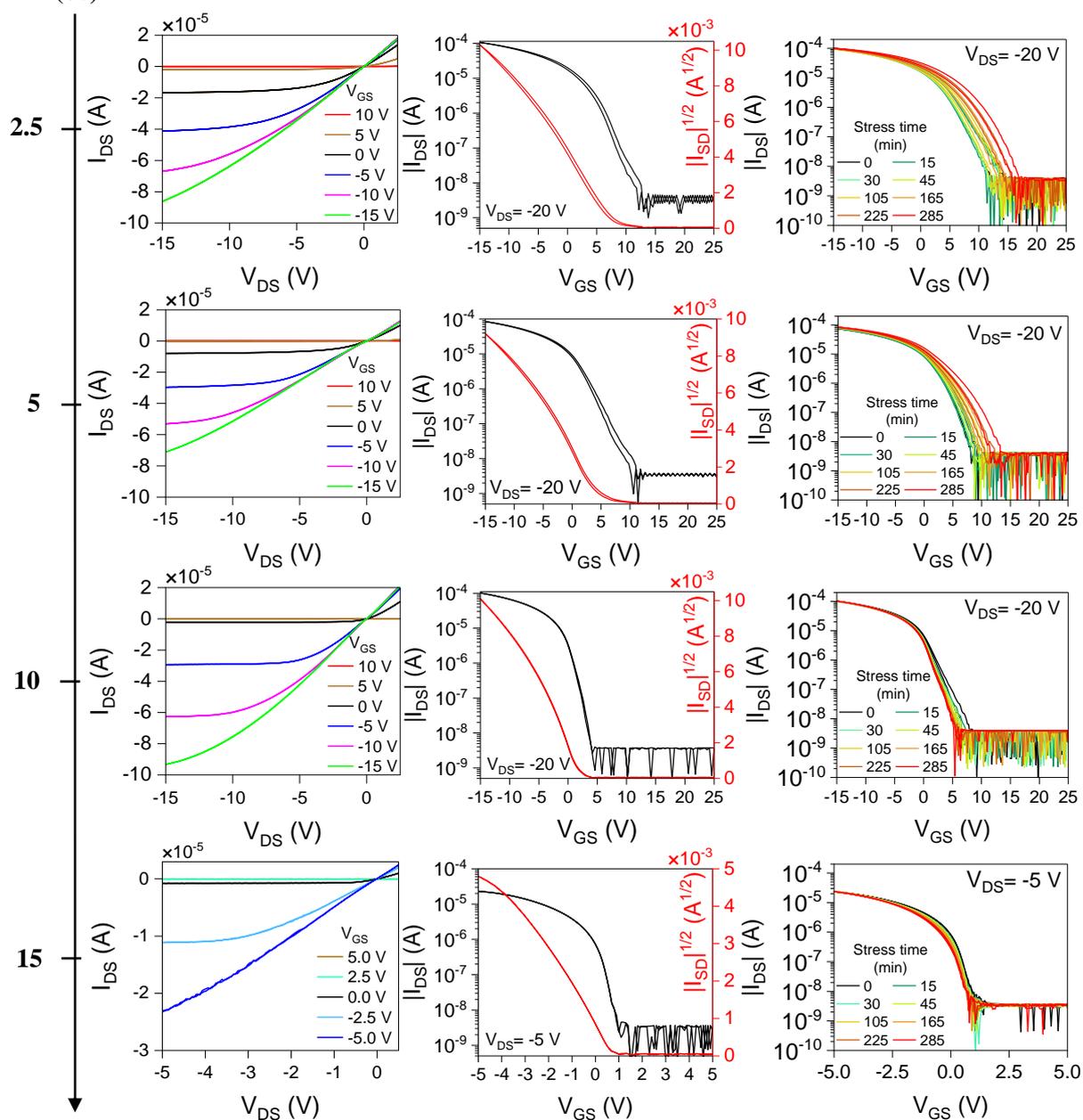


Figure S2. Transfer characteristics and bias stress measurements of OFETs in the saturation regime using a TMTES blended film with varying PS (280 kDa) content (2.5%, 5%, 10%, and 15%). Bias stress measurements were conducted after multiple cycles of bias stress at $V_{GS} = -10$ V and $V_{DS} = -1$ V, highlighting the impact of PS concentration on transfer characteristics and device stability.

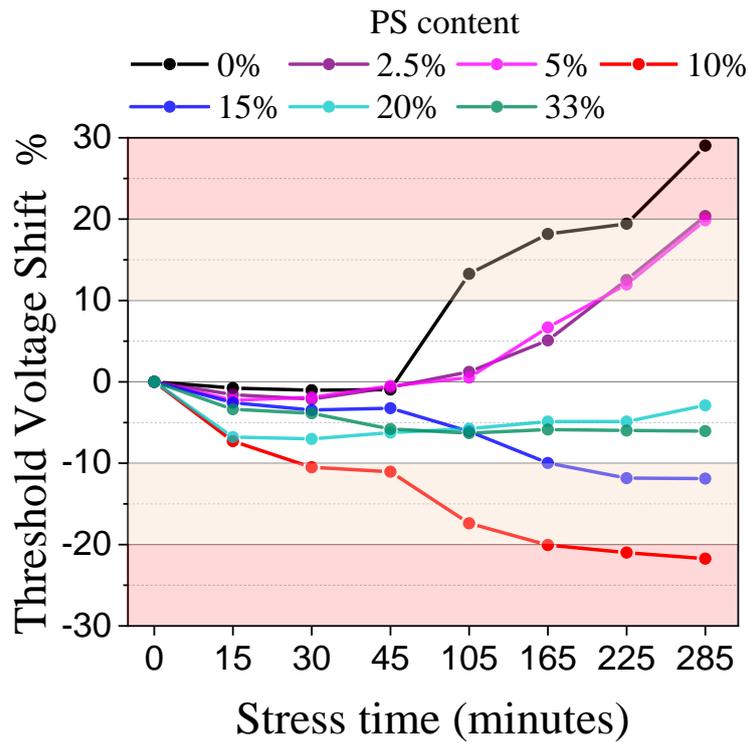


Figure S3. Threshold voltage shift (%) as a function of stress time (minutes) for TMTES OFETs with varying PS 280 kDa content (0%, 2.5%, 5%, 10%, 15%, 20%, and 33%). Devices with low PS content ($\leq 5\%$) exhibit reduced bias stability, showing a positive threshold voltage shift over time. At 10% PS content, devices begin to exhibit a negative threshold voltage shift, while those with $\geq 15\%$ PS content demonstrate enhanced stability, maintaining minimal shifts under prolonged stress conditions.

Table S1. Mean values with standard deviations of key electrical parameters for OFETs based on pristine TMTES and TMTES:PS blended films. Data are presented for various TMTES:PS ratios, expressed as PS content percentages relative to the total mass (TMTES + PS), and include PS with different average molecular weights (280 kDa, 100 kDa, and 10 kDa). Parameters were extracted from devices with conducting channels aligned parallel to the coating direction. The field-effect mobility corresponds to hole mobility in the saturation regime. Additionally, device sensitivity under X-ray exposure are reported.

PS M_w (kDa)	PS content (%)	Mobility ($\text{cm}^2\text{V}^{-1}\text{s}^{-1}$)	V_{th} (V)	N_t ($\text{eV}^{-1}\text{cm}^{-2}$)	Sensitivity $\times 10^3$ ($\mu\text{C Gy}^{-1}\text{cm}^{-2}$)
-	0	0.09 ± 0.01	13 ± 2	$(4 \pm 1) \times 10^{12}$	-
	2.5	0.21 ± 0.03	9.6 ± 0.9	$(5 \pm 2) \times 10^{12}$	-
	5	0.27 ± 0.03	7 ± 2	$(4 \pm 2) \times 10^{12}$	1.7 ± 0.4
	10	0.36 ± 0.05	2.2 ± 0.7	$(4 \pm 2) \times 10^{12}$	1.9 ± 0.7
280	15	0.8 ± 0.1	0.9 ± 0.2	$(1 \pm 6) \times 10^{11}$	3.0 ± 0.6
	20	1.2 ± 0.2	2.0 ± 0.5	$(8 \pm 2) \times 10^{11}$	4.0 ± 0.7
	33	1.3 ± 0.4	1.5 ± 0.7	$(6 \pm 1) \times 10^{11}$	5.6 ± 0.2
	67	0.9 ± 0.3	0.2 ± 0.1	$(6 \pm 1) \times 10^{11}$	1.7 ± 0.1
100	33	1.0 ± 0.3	0.2 ± 0.2	$(5 \pm 2) \times 10^{11}$	2.6 ± 0.5
10	33	1.1 ± 0.2	0.4 ± 0.2	$(4 \pm 1) \times 10^{11}$	2.8 ± 0.1

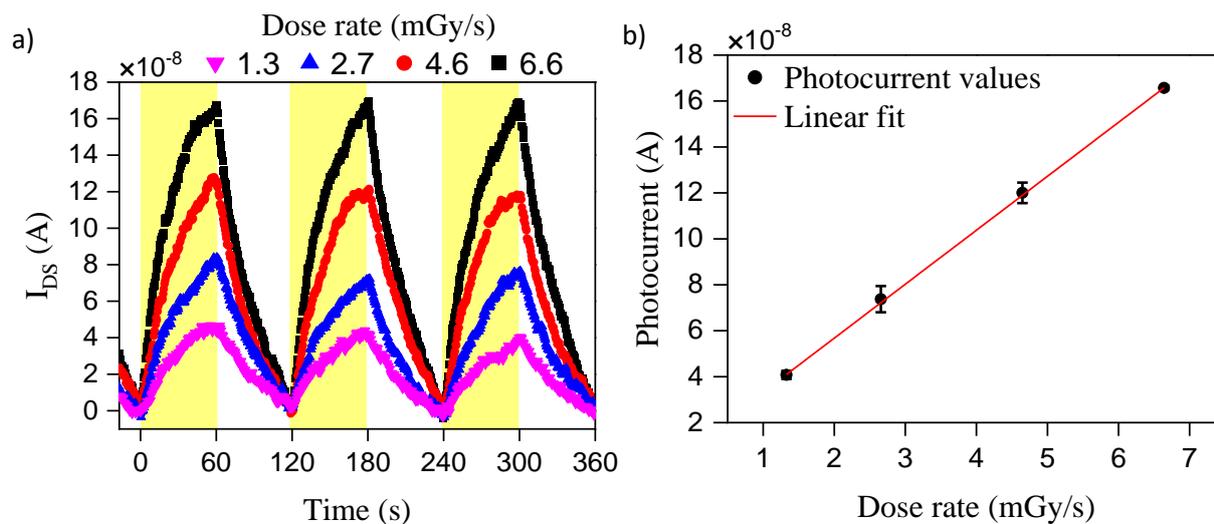


Figure S4. a) X-ray induced photocurrent response of a TMTES:PS (280 kDa, 33% PS content) BAMS-coated device upon three on/off switching cycles (yellow areas indicate 60 s exposure intervals) at increasing dose rates. b) X-ray induced photocurrent as a function of the X-ray dose rate, with sensitivity determined from the slope of the linear fit of the experimental points.

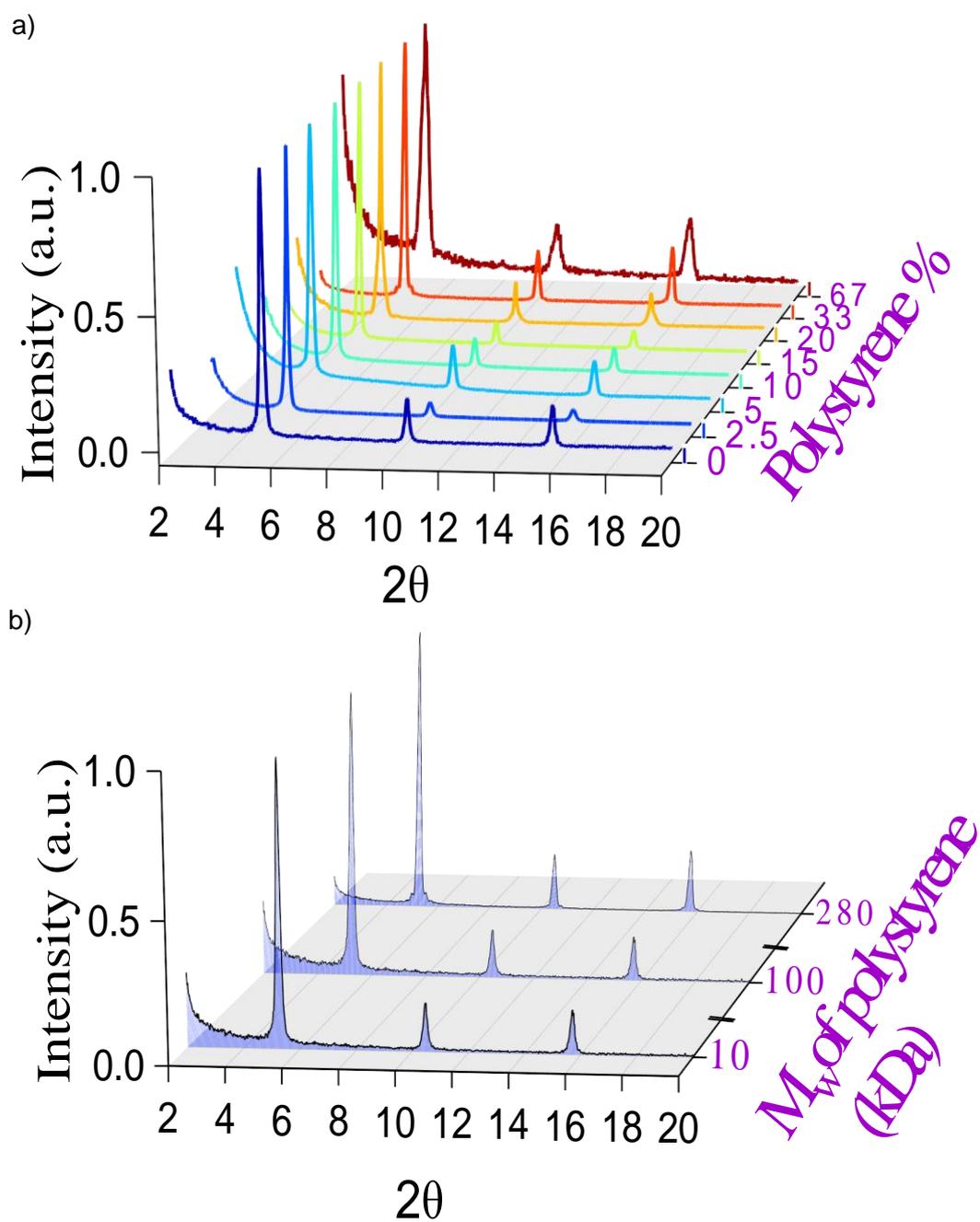


Figure S5. X-ray diffractograms of TMTES pristine and blended films deposited via BAMS, presented for (a) varying PS (280 kDa) content percentages (0%, 2.5%, 5%, 10%, 15%, 20%, 33% and 67%) and (b) different PS Mw (10 kDa, 100 kDa and 280 kDa) at a fixed 33% PS content.

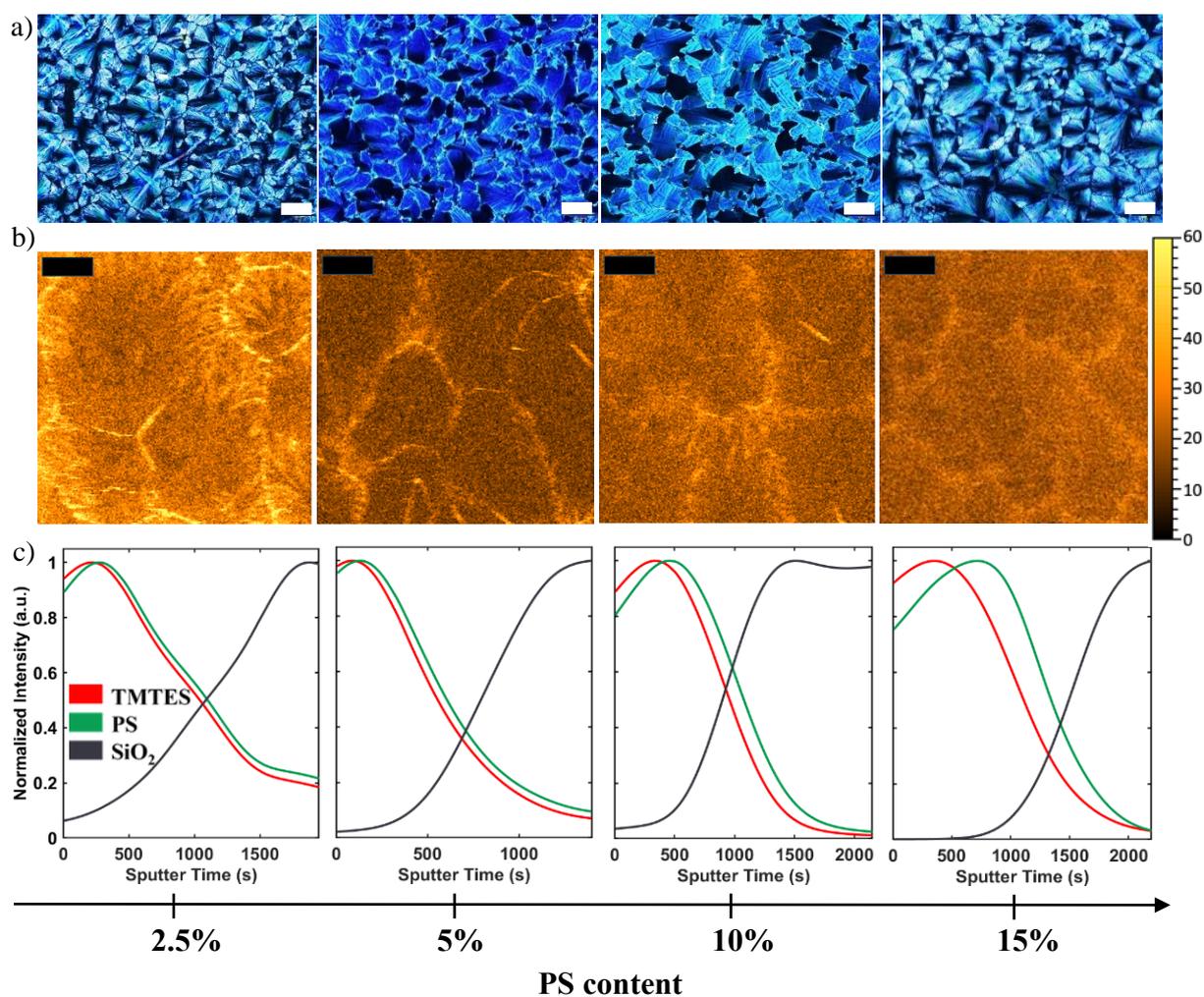


Figure S6. Analysis of TMTES:PS films, including (a) crossed-polarized optical microscopy images displaying a 50 μm scale bar (in white), (b) ToF-SIMS surface chemical maps of total ions with a 20 μm scale bar (in black), and (c) normalized (to maximum) ToF-SIMS depth profiles obtained in the channel area of the OFETs. The PS (280 kDa) content in the film increases progressively from left to right as a percentage of the total mass (TMTES + PS). The ToF-SIMS analysis starts at the film's outer surface and extends to the SiO₂ layer. The TMTES signal (red curve) represents the average intensity of SiC⁻, SiCH⁻, SiC₂H⁻, SiC₅H₂⁻, SiC₇H₂⁻ species; the PS signal (green curve) corresponds to the average of C₃H₃⁻, C₄H₄⁻, C₅H₃⁻, C₆H₃⁻, C₇H₃⁻ ions, and the substrate (black curve) is represented by the SiO₂⁻ ion.

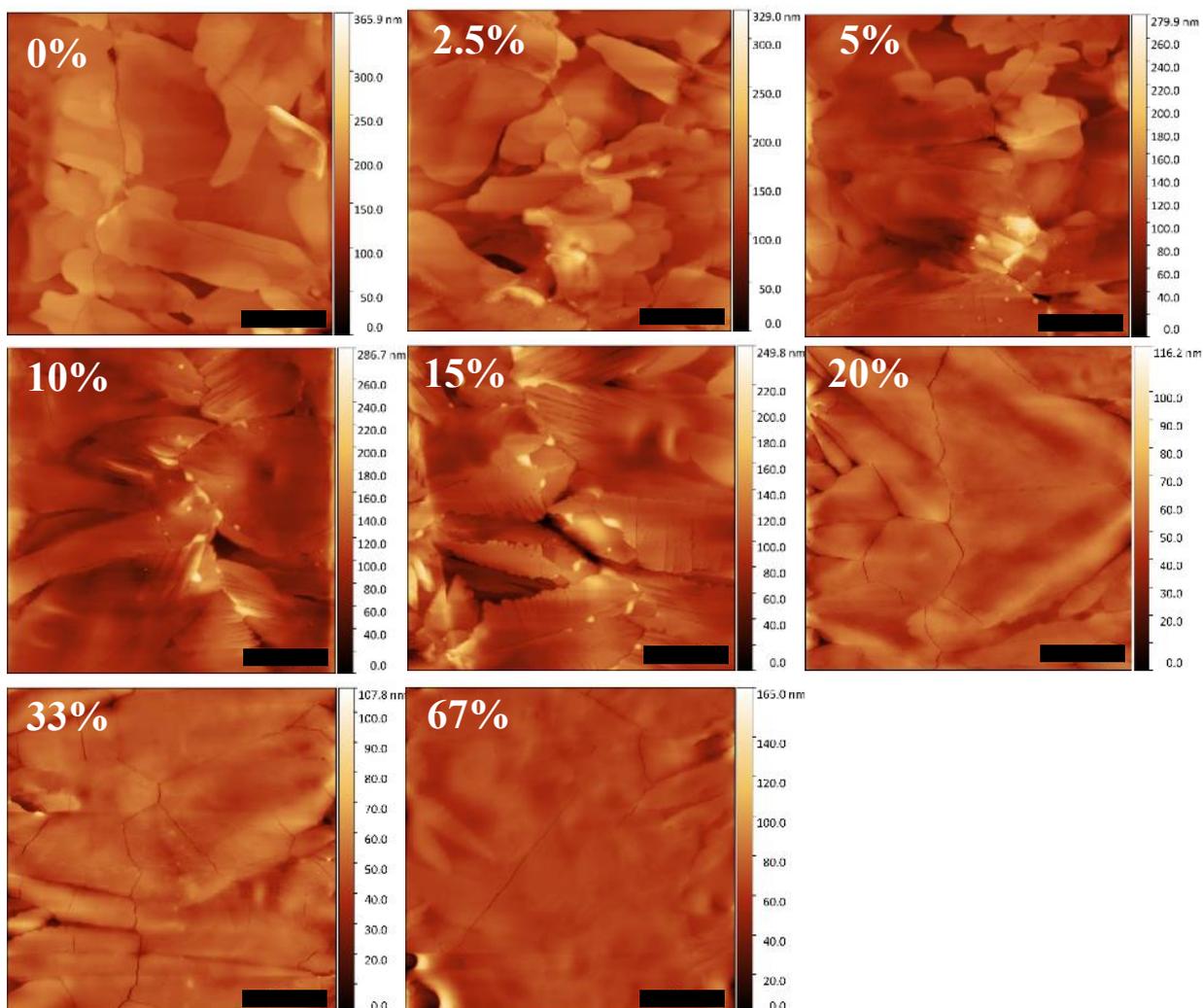


Figure S7. AFM topographic images of TMTES films deposited via BAMS, blended with PS (280 kDa) at varying PS content percentages (0%, 2.5%, 5%, 10%, 15%, 20%, 33% and 67%). Scale bar: 5 μ m (black).

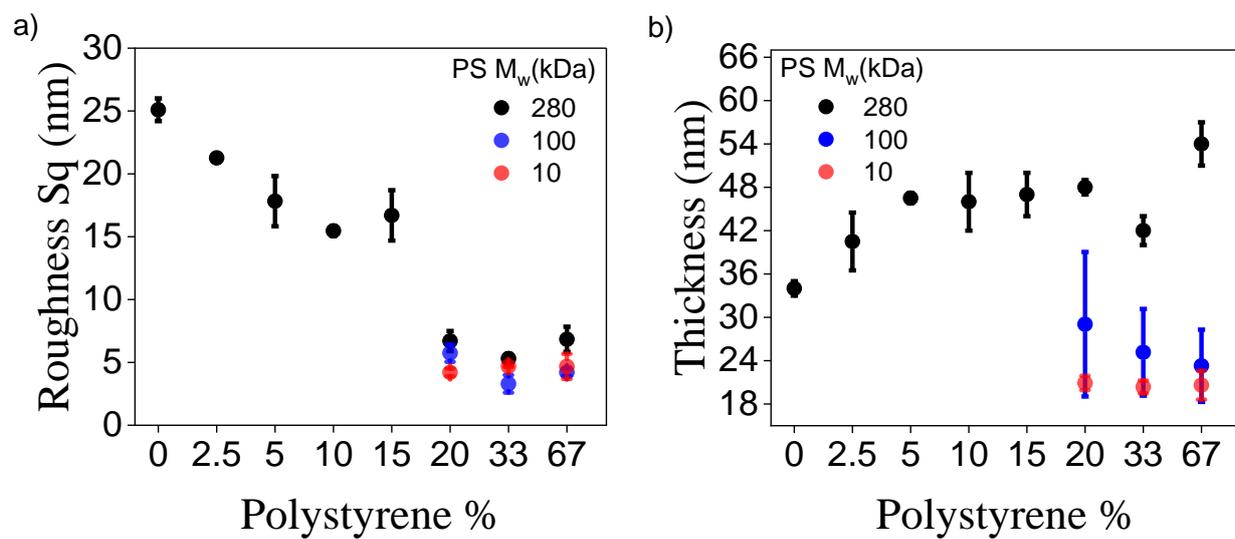


Figure S8. Mean values and standard deviations of a) roughness and b) thickness extracted by AFM images of all films deposited by BAMS, blended with different PS Mw (10 kDa, 100 kDa and 280 kDa) and PS content percentages (0%, 2.5%, 5%, 10%, 15%, 20%, 33% and 67%).

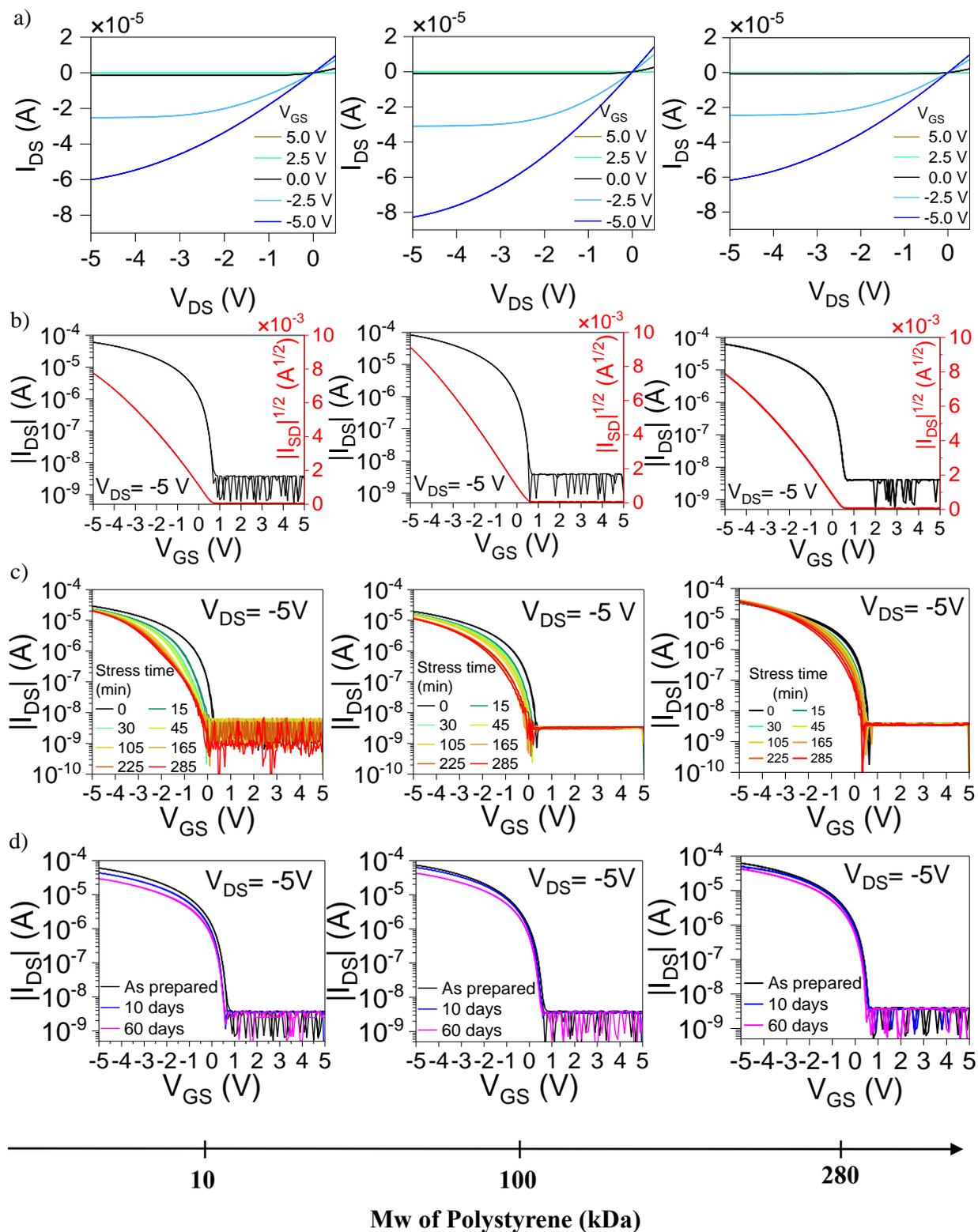


Figure S9. Electrical performance of representative OFETs incorporating TMTES:PS films with fixed 33% PS content, shown for increasing PS molecular weight from left to right (10 kDa, 100 kDa and 280 kDa). Presented data include: a) output characteristics, b) transfer characteristics in the saturation regime, c) transfer characteristics in saturation regime after multiple bias stress cycles at $V_{GS} = -10$ V and $V_{DS} = -1$ V, and d) shelf stability of the devices.

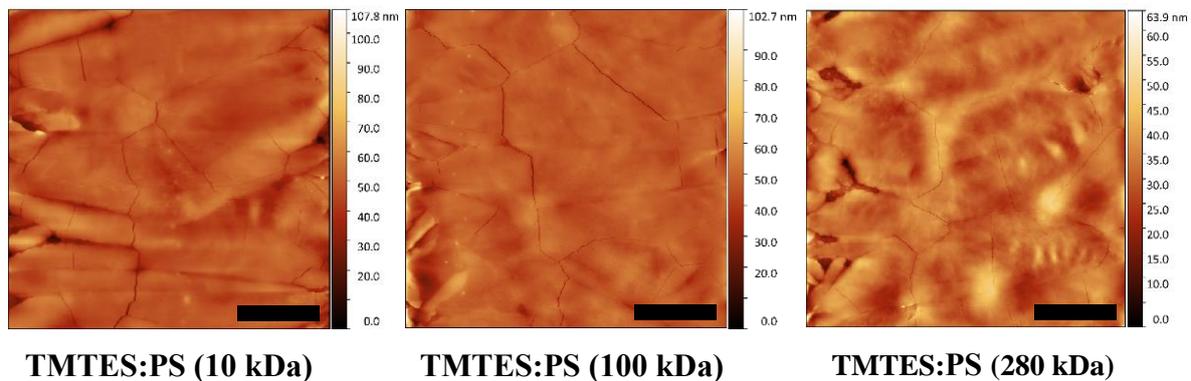


Figure S10. AFM topographic images of TMTES:PS blended films deposited via BAMS with a fixed 33% PS content and varying PS molecular weight (10 kDa, 100 kDa, and 280 kDa). Scale bar: 5 μm (black).