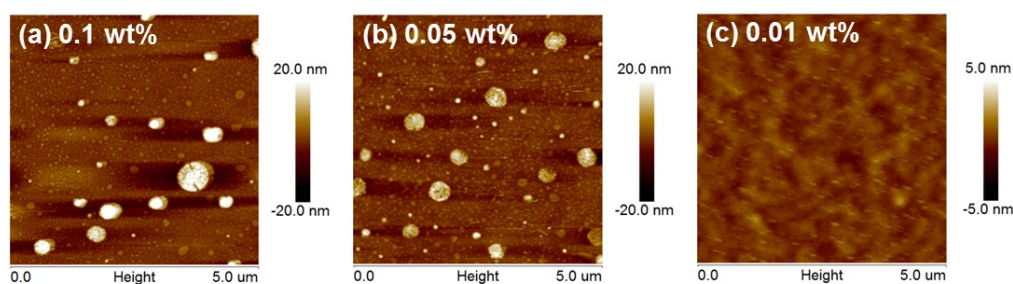


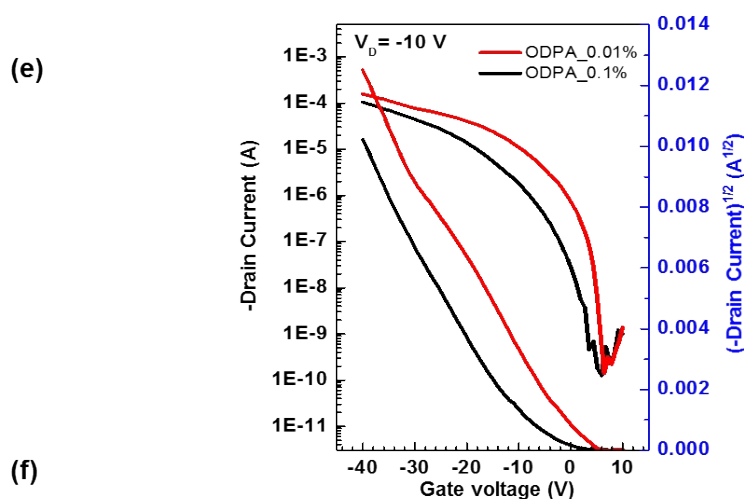
1 **Supplementary Materials: Metal-oxide assisted surface treatment of polyimide gate**  
2 **insulator for high-performance organic thin-film transistors**

3



(d)

ODPA concentration (wt%)	Water Contact angle (°)	Roughness (nm)
0.1	97.7	4.48
0.05	98.8	3.22
0.01	97.5	0.41



(f)

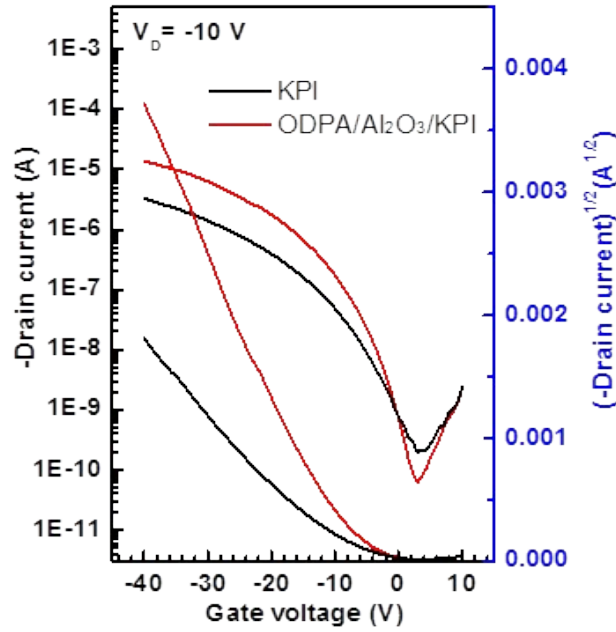
OGI	$\mu$ (cm <sup>2</sup> /Vs)	$V_{th}$ (V)	SS (V/dec)	$I_{on}$ (A)	$I_{off}$ (A)	$I_{on} / I_{off}$
ODPA(0.1%)/Al <sub>2</sub> O <sub>3</sub> /KPI	1.06	-8.53	7.13	1.03E-04	1.38E-10	7.47E+05
ODPA(0.01%)/Al <sub>2</sub> O <sub>3</sub> /KPI	1.46	-7.47	5.31	1.53E-04	1.56E-10	9.81E+05

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6 **Fig. S1** (a-c) AFM images (5  $\mu\text{m} \times 5 \mu\text{m}$ ) of ODPA/ $\alpha$ -Al<sub>2</sub>O<sub>3</sub>/KPI thin films as different concentrations  
7 of ODPA in ethanol solution (0.1, 0.05 and 0.01 wt%), respectively. (d) Surface properties of each film  
8 were summarized in table. (e) Transfer curve and (f) electrical characteristics of Ph-BTBT-C<sub>10</sub> TFTs

- 1 with ODPA/ $\alpha$ -Al<sub>2</sub>O<sub>3</sub>/KPI gate insulators as different concentration of ODPA in ethanol solution (0.1
- 2 and 0.01 wt%)



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4  
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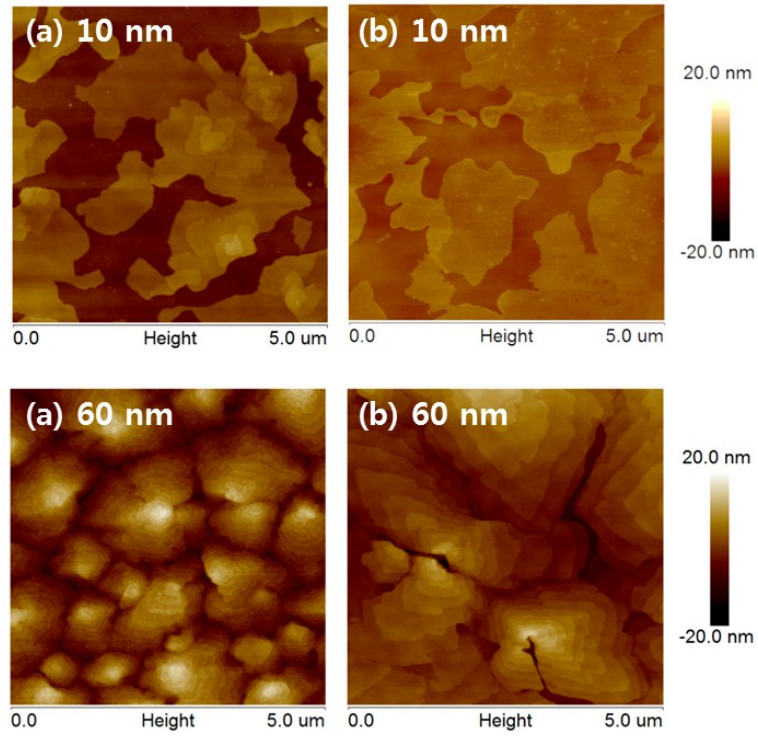
Gate Insulator	Mobility <sup>a</sup> [cm <sup>2</sup> /Vs]	V <sub>th</sub> [V]	S-slope [V/decade]	I <sub>on</sub> /I <sub>off</sub>
KPI	0.04 ± 0.02	-13.62	8.91	1.64 x 10 <sup>4</sup>
ODPA/ $\alpha$ -Al <sub>2</sub> O <sub>3</sub> /KPI	0.14 ± 0.03	-9.57	6.55	2.17 x 10 <sup>5</sup>

6 <sup>a</sup> Average field-effect mobility of 12 TFT devices.

7

8 **Fig. S2** Transfer characteristics and electrical properties of the pentacene TFTs non-treated KPI and  
9 ODPA/ $\alpha$ -Al<sub>2</sub>O<sub>3</sub>/KPI gate insulators.

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2 **Fig. S3** AFM images ( $5 \mu\text{m} \times 5 \mu\text{m}$ ) of 10 nm and 60 nm-thick pentacene layers on (a) non-treated KPI  
3 and (b) ODPA/ $\alpha$ -Al<sub>2</sub>O<sub>3</sub>-treated KPI gate insulator films.

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