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Supplementary information of

Article

Direct Comparison of the Effect of Processing Conditions in Electrolyte-Gated and Bottom-Gated TIPS-Pentacene Transistors

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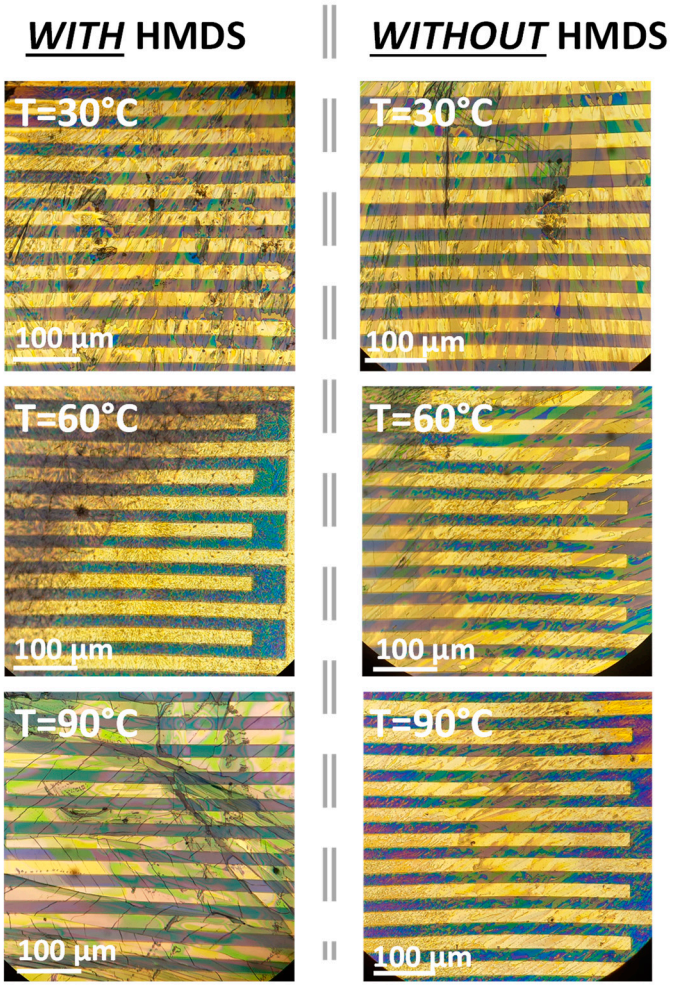

Figure S1. High-resolution optical image of TIPS-Pentacene deposed on top of the interdigitated source and drain electrodes for the three deposition temperature with and without HMDS functionalization (TIPS-P5 in 1% solution).

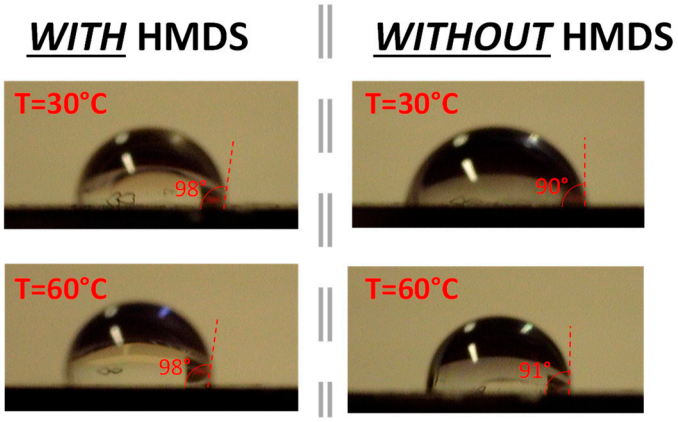

Figure S2. Contact angle measurement after TIPS-pentacene deposition with and without HMDS treatment (TIPS-P5 in 1% solution).

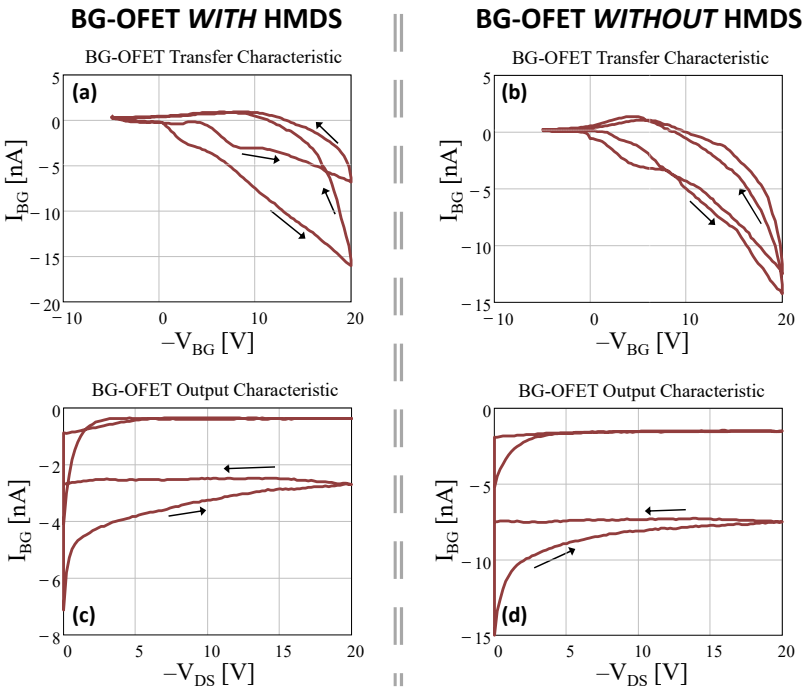

Figure S3. Bottom-Gate leakage currents of the transfer (upper panels) and output (lower panels) characteristics for BG-OFETs with (left panels) and without (right panels) HMDS functionalization (to be compared with Figure 3): (**a**) Transfer characteristics with HMDS; (**b**) transfer characteristics without HMDS; (**c**) output characteristics with HMDS; (**d**) output characteristics without HMDS.

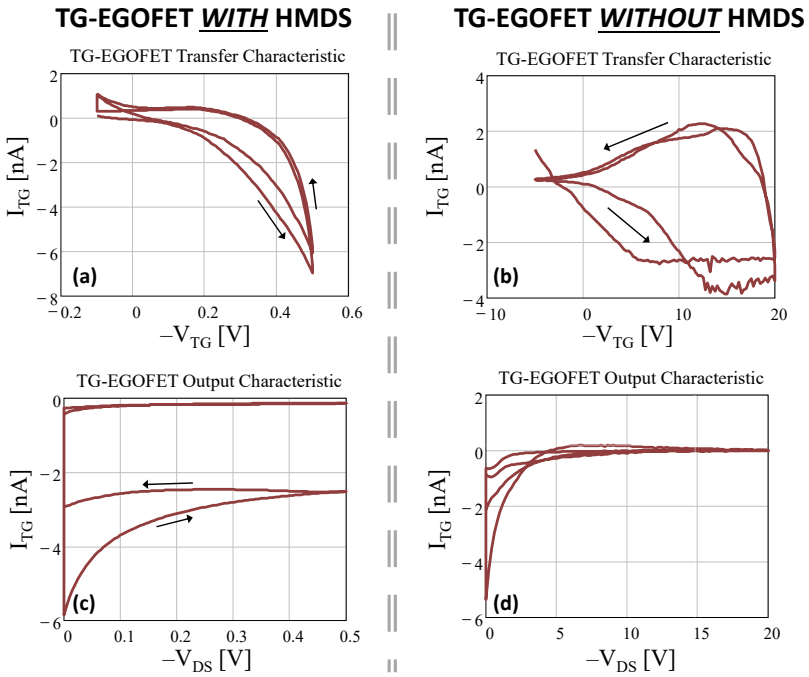

Figure S4. Top-Gate leakage currents of the transfer (upper panels) and output (lower panels) characteristics for TG-EGOFETs with (left panels) and without (right panels) HMDS functionalization (to be compared with Figure 4): (**a**) Transfer characteristics with HMDS; (**b**) transfer characteristics without HMDS; (**c**) output characteristics with HMDS; (**d**) output characteristics without HMDS.

Table S1. BG-OFETs parameters extrapolated using equation the trans-conductance method. The method was not applicable to all the devices, and it strongly underestimates devices threshold voltages that are not compatible whit the output characteristics (see Figure 3).

TIPS-P5 Solution	Deposition Temperature (°C)	With HMDS Functionalization		Without HMDS Functionalization	
		Mobility ($cm^2\ V^{-1}\ s^{-1}$)	Threshold Voltage (V)	Mobility ($cm^2\ V^{-1}\ s^{-1}$)	Threshold Voltage (V)
1%	30	3.01×10^{-4}	0.75	\	\
	60	1.13×10^{-3}	0.61	2.84×10^{-4}	0.75
	90	2.38×10^{-3}	−1.28	2.61×10^{-4}	−0.7
5%	30	4.17×10^{-4}	−3.5	1.49×10^{-4}	0.55
	60	8.94×10^{-4}	0.25	2.64×10^{-4}	0.85
	90	2.98×10^{-3}	−0.45	5.07×10^{-4}	0.6

Table S2. TG–OFETs parameters extrapolated using equation the trans-conductance method. The method was not applicable to all the devices, and it strongly overestimates devices threshold voltages that are not compatible whit the output characteristics (see Figure 4).

TIPS-P5 Solution	Deposition Temperature (°C)	With HMDS Functionalization		Without HMDS Functionalization	
		Mobility ($cm^2\ V^{-1}\ s^{-1}$)	Threshold Voltage (mV)	Mobility ($cm^2\ V^{-1}\ s^{-1}$)	Threshold Voltage (mV)
1%	30	5.16×10^{-4}	−163.71	1.53×10^{-3}	−124.73
	60	1.09×10^{-4}	−57.75	9.45×10^{-4}	−125.25
	90	1.09×10^{-4}	−127.2	5.94×10^{-4}	−177.82
5%	30	1.99×10^{-4}	−111.43	2.62×10^{-4}	−86.4
	60	5.08×10^{-5}	−60	5.72×10^{-4}	−90
	90	3.35×10^{-5}	−9.43	2.66×10^{-4}	−86