

Supporting information

All-polymer field-effect transistors using a brush gate dielectric

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Table S1. Mobility, threshold voltages (V_T), and on/off ratios for all of the devices measured. Threshold voltages are obtained from the $I_d^{1/2}(V_g)$ transfer characteristics in the saturated regime ($V_d = -60$ V), and the on/off ratios are also taken from the transfer characteristics with $V_d = V_g = -60$ V.

	Mobility ($\text{cm}^2 \text{V}^{-1} \text{s}^{-1}$)		V_T (V)		on/off ratio	
	P3HT22	P3HT42	P3HT22	P3HT44	P3HT22	P3HT42
700 nm PMMA film	9.7×10^{-4}	1.02×10^{-3}	-5.6	-13.3	579	318
24 h at 40°C	1.02×10^{-3}	3.8×10^{-4}	-7.2	-14.6	863	265
5 min at 78°C	1.17×10^{-3}	4.3×10^{-4}	-5.6	-10.3	632	430
24 h at 78°C	1.61×10^{-3}	3.1×10^{-4}	-0.8	-3.3	148	110
5 min at 100°C	1.28×10^{-3}	3.4×10^{-4}	-0.3	-9.8	551	302
24 h at 100°C	1.28×10^{-3}	2.3×10^{-4}	-0.3	4.4	175	42
5 min at 150°C	1.06×10^{-3}	2.6×10^{-4}	-3.3	-9.9	292	183
24 h at 150°C	9.0×10^{-4}	2.2×10^{-4}	-11.0	-7.2	17	101

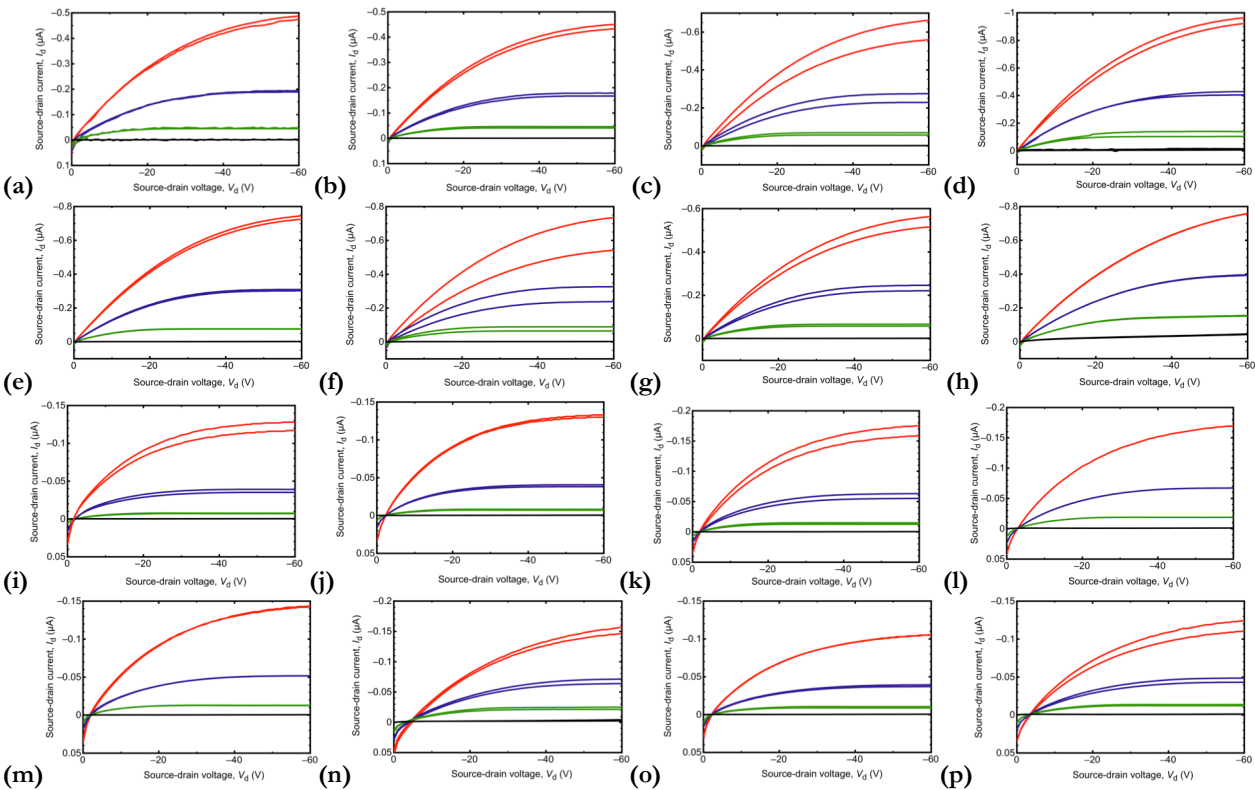


Figure S1. Output characteristics of P3HT22 (a)-(h) and P3HT42 (i)-(p) FETs with PMMA brushes as gate insulators. (a) and (i) Reference samples, using a 700 nm-thick PMMA film spin-coated from n-butyl acetate rather than a brush, and with no heat treatment before or after P3HT deposition; (b) and (j) samples annealed at 40°C for 24 h; (c) and (k) samples annealed at 78°C for 5 min; (d) and (l) samples annealed at 78°C for 24 h (for (l) only one measurement was taken); (e) and (m) samples annealed at 100°C for 5 min; (f) and (n) samples annealed at 100°C for 24 h; (g) and (o) samples annealed at 150°C for 5 min; and (h) and (p) samples annealed at 150°C for 24 h. The gate voltages are $V_g = 0, -20, -40$, and -60 V and are indicated by red, blue, green, and black curves respectively.