Electronic Supplementary Information

Selective and non-selective modification of electrodes in organic thin film transistors by self-assembling monolayers

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Table S1. Parameters of the peaks in the XRD curves for the P3HT/ITO and P3HT/SAM/ITO samples (Figure 5) as well as the derived grain size of P3HT. The relevant SAMs are termed either directly or by the portions of CF_3-BA in the primary CF_3-BA/OCH_3-BA solutions.

Sample	Peak position (°)	FWHM	Grain size (Å)	Intensity
Pristine (ITO)	5.405	0.500	159.5	50
OCH_3-BA	5.261	0.510	156.4	48
20%	5.287	0.500	159.5	38
40%	5.261	0.464	170.7	37
60%	5.287	0.550	145.0	46
80%	5.339	0.520	153.4	43
CF_3-BA	5.287	0.520	153.4	45

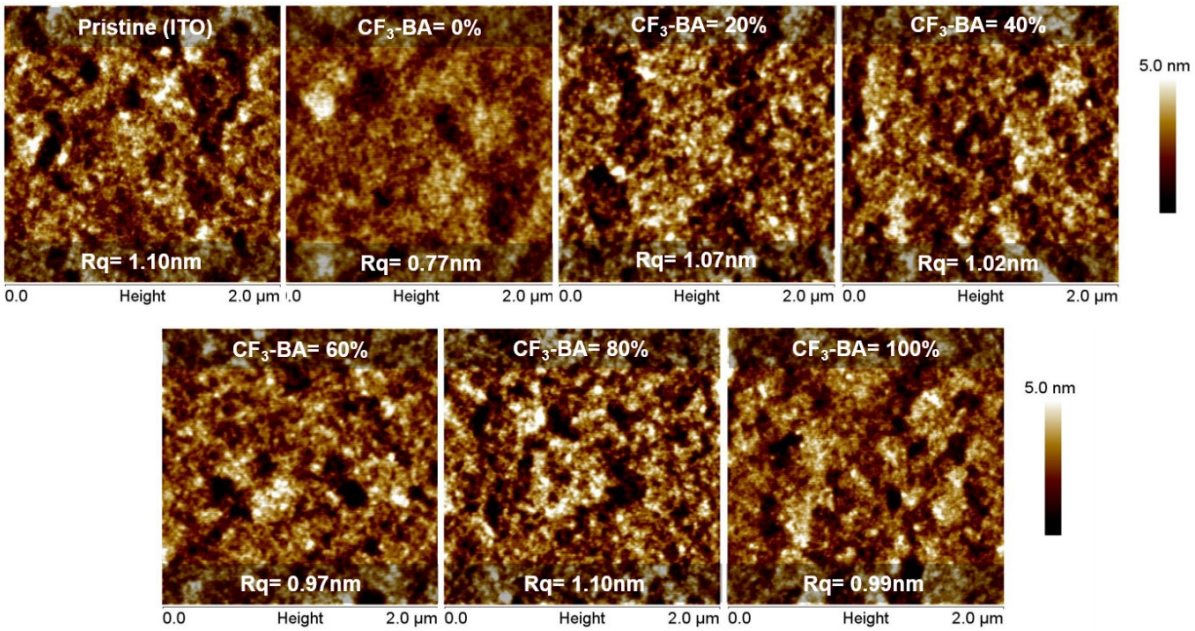

Figure S1. AFM images of the P3HT/ITO and P3HT/SAM/ITO samples. The relevant SAMs are termed by the portions of CF_3-BA in the primary CF_3-BA/OCH_3-BA solutions. Surface roughness (R_q) derived from these images is marked.

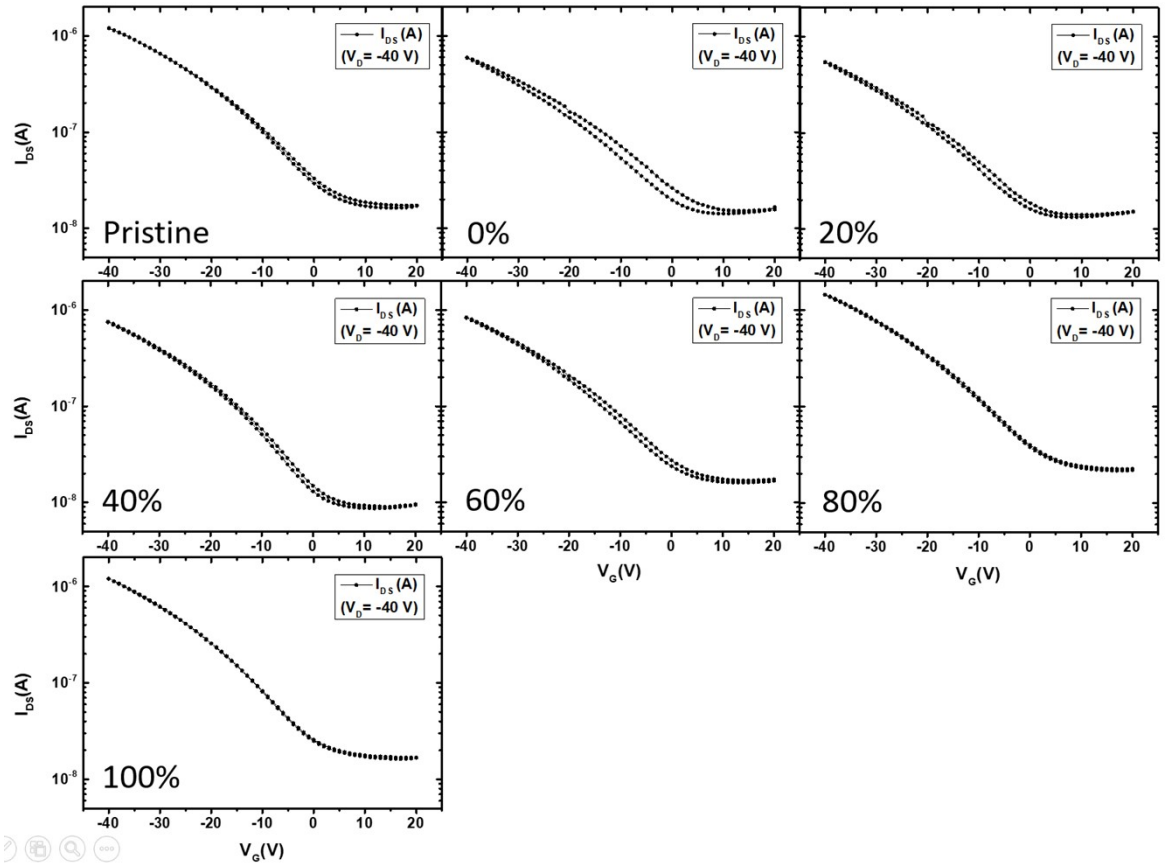

Figure S2. Typical transfer characteristics (I_{DS} vs V_G) of the OTFTs with untreated (pristine) and SAM-engineered ITO electrodes. I_{DS} is current between source and drain, V_D – potential difference between these electrodes, and V_G – gate voltage. The relevant SAMs are termed by the portions of CF_3-BA in the primary CF_3-BA/OCH_3-BA solutions.

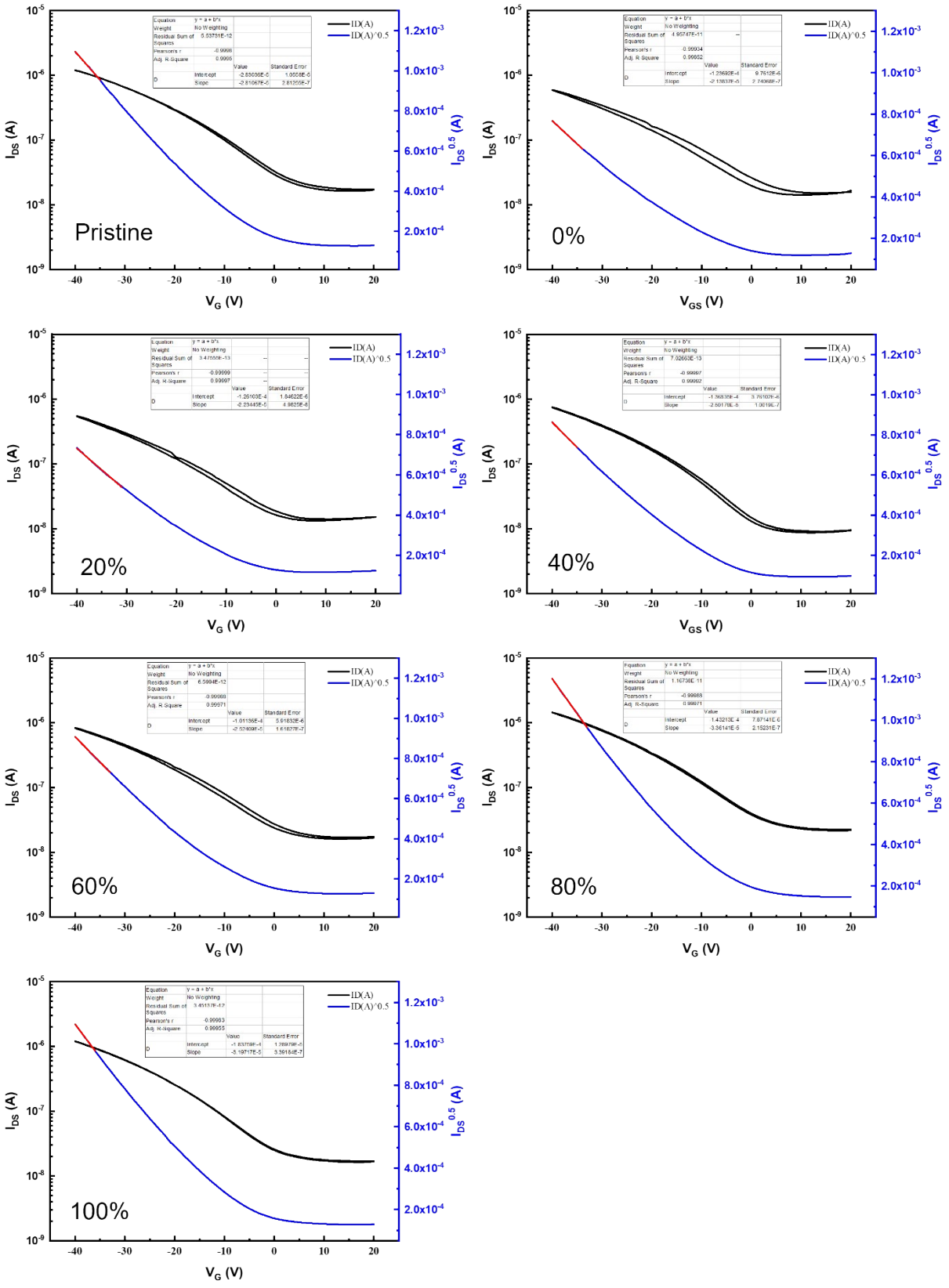

Figure S3. The fitting of the linearity of the square-root drain current versus gate voltage curves ($I_{DS}^{0.5}$ vs V_G) of the OTFT with untreated (pristine) and BA-SAM-engineered ITO electrodes. The fitting position in each curve is marked in red. The relevant SAMs are termed by the portions of CF_3-BA in the primary CF_3-BA/OCH_3-BA solutions.

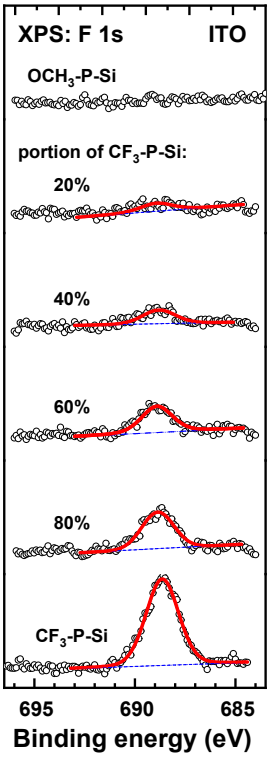

Figure S4. F 1s XP spectra of OCH_3-P-Si/CF_3-P-Si SAMs on ITO. The spectra are fitted by a single peak (red solid lines). The SAM-engineered surfaces are termed either directly or by the portion of CF_3-BA in the primary solutions.

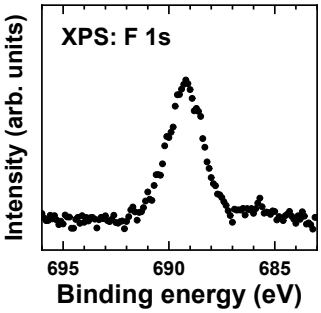

Figure S5. F 1s XP spectrum of CF_3-P-Si SAM on glass.

Table S2. Parameters of the peaks in the XRD curves for the P3HT/ITO and P3HT/SAM/ITO samples (Figure 10a) as well as the derived grain size of P3HT. The relevant SAMs are termed either directly or by the portions of CF_3-P-Si in the primary CF_3-P-Si/OCH_3-P-Si solutions.

Sample	Peak position (°)	F.W.H.M.	Grain size (Å)	Intensity
Pristine (ITO)	5.713	0.593	134.5	174
OCH_3-P Si	5.560	0.590	135.2	261
20%	5.630	0.603	132.3	202
40%	5.615	0.512	155.8	145
60%	5.670	0.516	154.6	118
80%	5.604	0.510	156.4	161
CF_3-P Si	5.633	0.506	157.6	219

Table S3. Parameters of the peaks in the XRD curves for the P3HT/glass and P3HT/SAM/glass samples (Figure 10b) as well as the derived grain size of P3HT. The relevant SAMs are termed either directly or by the portions of CF_3-P-Si in the primary CF_3-P-Si/OCH_3-P-Si solutions.

Sample	Peak position (°)	F.W.H.M.	Grain size (Å)	Intensity
Pristine (glass)	5.620	0.626	127.4	50
OCH_3-P Si	5.634	0.566	140.9	172
20%	5.560	0.633	126.0	160
40%	5.676	0.580	137.5	180
60%	5.641	0.510	156.4	125
80%	5.667	0.486	164.1	69
CF_3-P Si	5.579	0.500	159.5	216

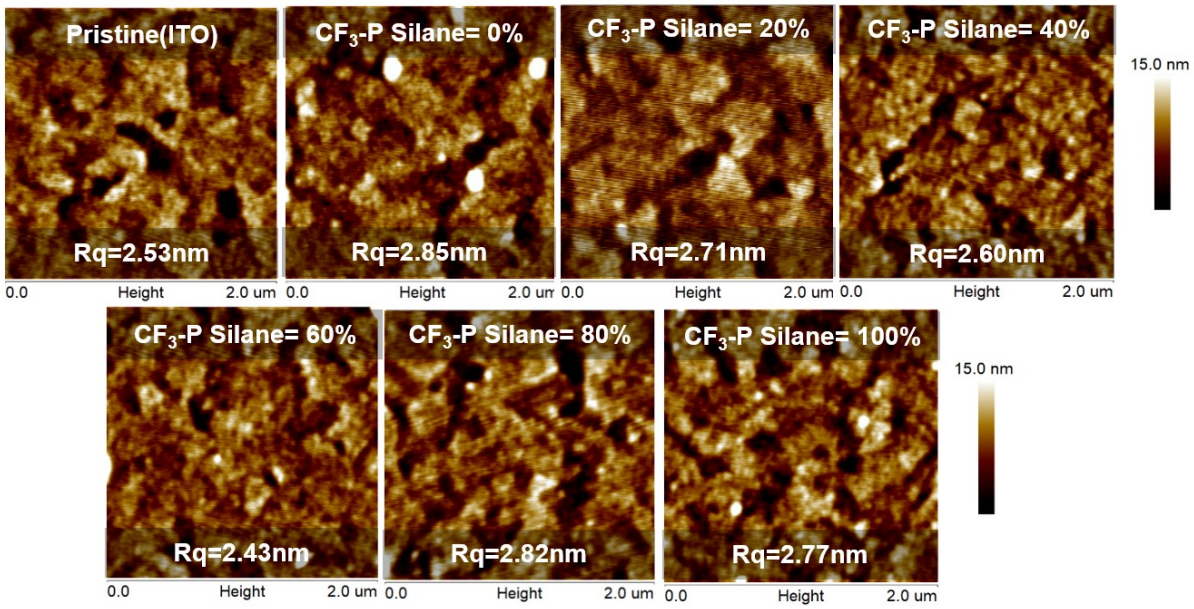

Figure S6. AFM images of the P3HT/ITO and P3HT/SAM/ITO samples. The relevant SAMs are termed by the portions of CF_3-P-Si in the primary CF_3-P-Si/OCH_3-P-Si solutions. Surface roughness (R_q) derived from these images is marked.

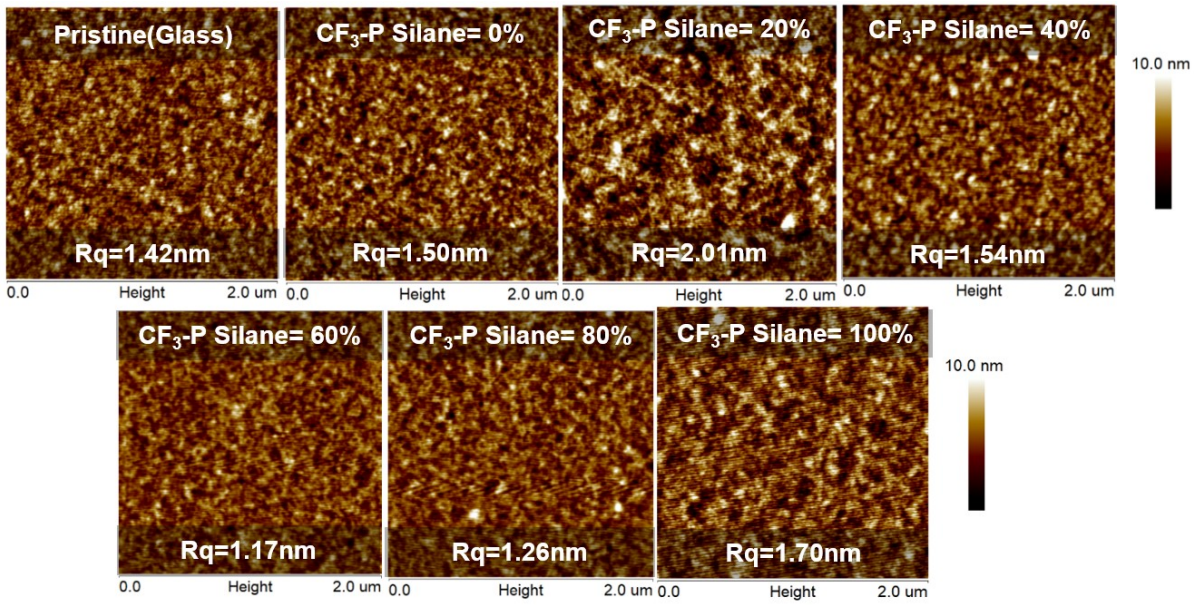

Figure S7. AFM images of the P3HT/glass and P3HT/SAM/glass samples. The relevant SAMs are termed by the portions of CF_3-BA in the primary CF_3-BA/OCH_3-BA solutions. Surface roughness (R_q) derived from these images is marked.

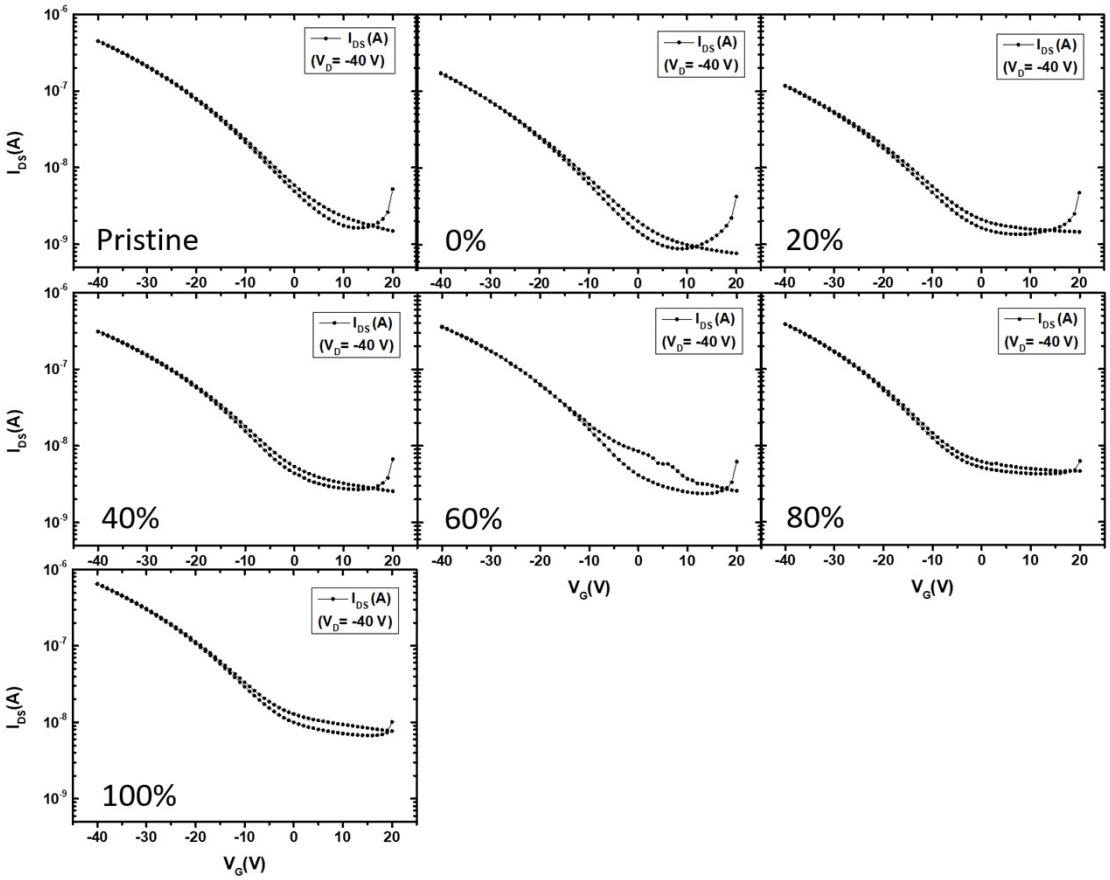

Figure S8. Typical transfer characteristics (I_{DS} vs V_G) of the OTFTs with untreated (pristine) and SAM-engineered ITO electrodes and glass substrate. I_{DS} is current between source and drain, V_D – potential difference between these electrodes, and V_G – gate voltage. The relevant SAMs are termed by the portions of CF_3-P-Si in the primary CF_3-P-Si/OCH_3-P-Si solutions.