Electronic Supplementary Material (ESI) for Materials Advances.

Experimental Design of Stencil-Printed High-Performance Organic Electrochemical Transistor

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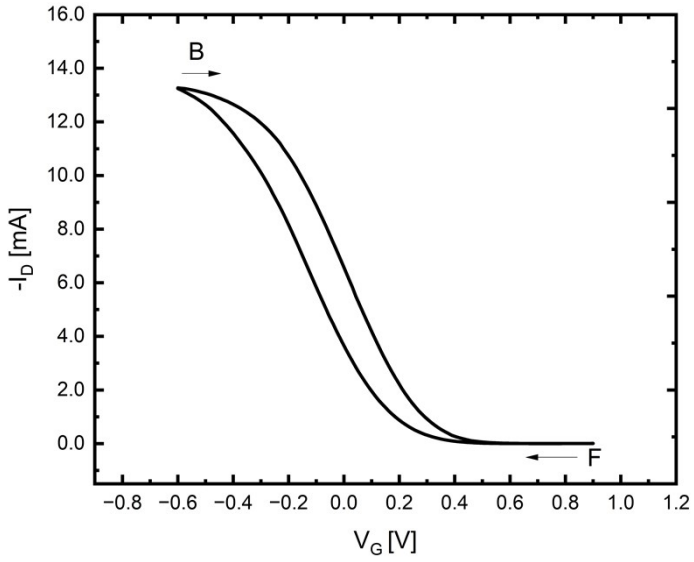

Figure SI1 Transfer Curve of the optimized device (Forward/Backward)

Table. S1 The Experimental Plan reporting average and standard deviation of each response

L (mm)	***T (C)***	***t (min)***	***on/off ratio***	***g_m (mS)***	***V_T (V)***
1.5	*90*	*10*	*10100 ± 2000*	*29.0 ± 6.8*	*0.27 ± 0.07*
2.5	*90*	*10*	*8050 ± 450*	*29.1 ± 0.3*	*0.37 ± 0.01*
1.5	*90*	*120*	*6900 ± 700*	*30.0 ± 3.0*	*0.46 ± 0.01*
2.5	*90*	*120*	*5600 ± 200*	*26.9 ± 0.1*	*0.46 ± 0.01*
2.0	*115*	*65*	*7550 ± 660*	*31.0 ± 4.9*	*0.50 ± 0.07*
1.5	*140*	*10*	*2800 ± 300*	*29.8 ± 0.9*	*0.62 ± 0.01*
2.5	*140*	*10*	*4500 ± 1100*	*28.6 ± 5.9*	*0.56 ± 0.08*
1.5	*140*	*120*	*1270 ± 170*	*24.8 ± 2.9*	*0.65 ± 0.03*
2.5	*140*	*120*	*1970 ± 820*	*26.9 ± 3.8*	*0.53 ± 0.03*
2.0	*90*	*10*	*6800 ± 1900*	*22.5 ± 4.3*	*0.26 ± 0.03*

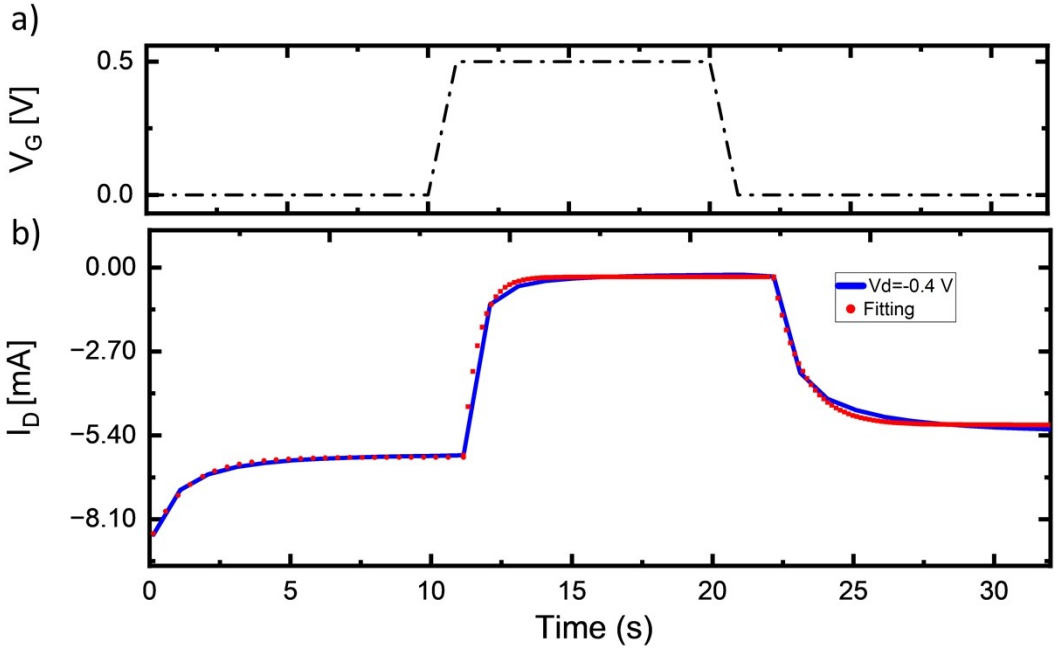

Figure SI2 measured time response of an OECT in response to a square step of the gate voltage while V_D maintained constant (-0.4 V). a) a square V_G pulse of 0.5 V b)monotonic relaxation of Id toward steady state fitted using Bernards' model and estimated time constant is 0.52s.

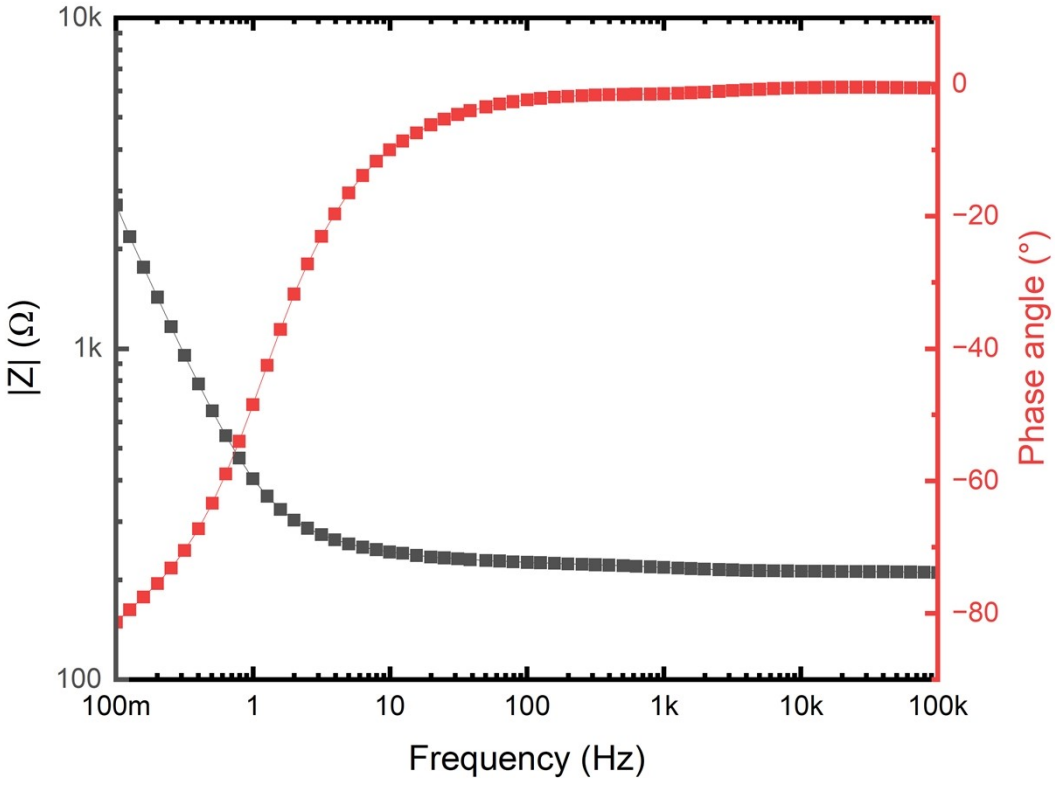

Figure SI3 Bode plots of Electrochemical impedance spectroscopy (EIS) measurement(Counter electrode: platinum wire, working electrode: PEDOT:PSS channel, Reference electrode: Ag/AgCl wire). An equivalent circuit model (Randles) was fitted. The extracted value of raw capacitance is 0.5 mF and volumetric capacitance C is 4 F/cm3.*

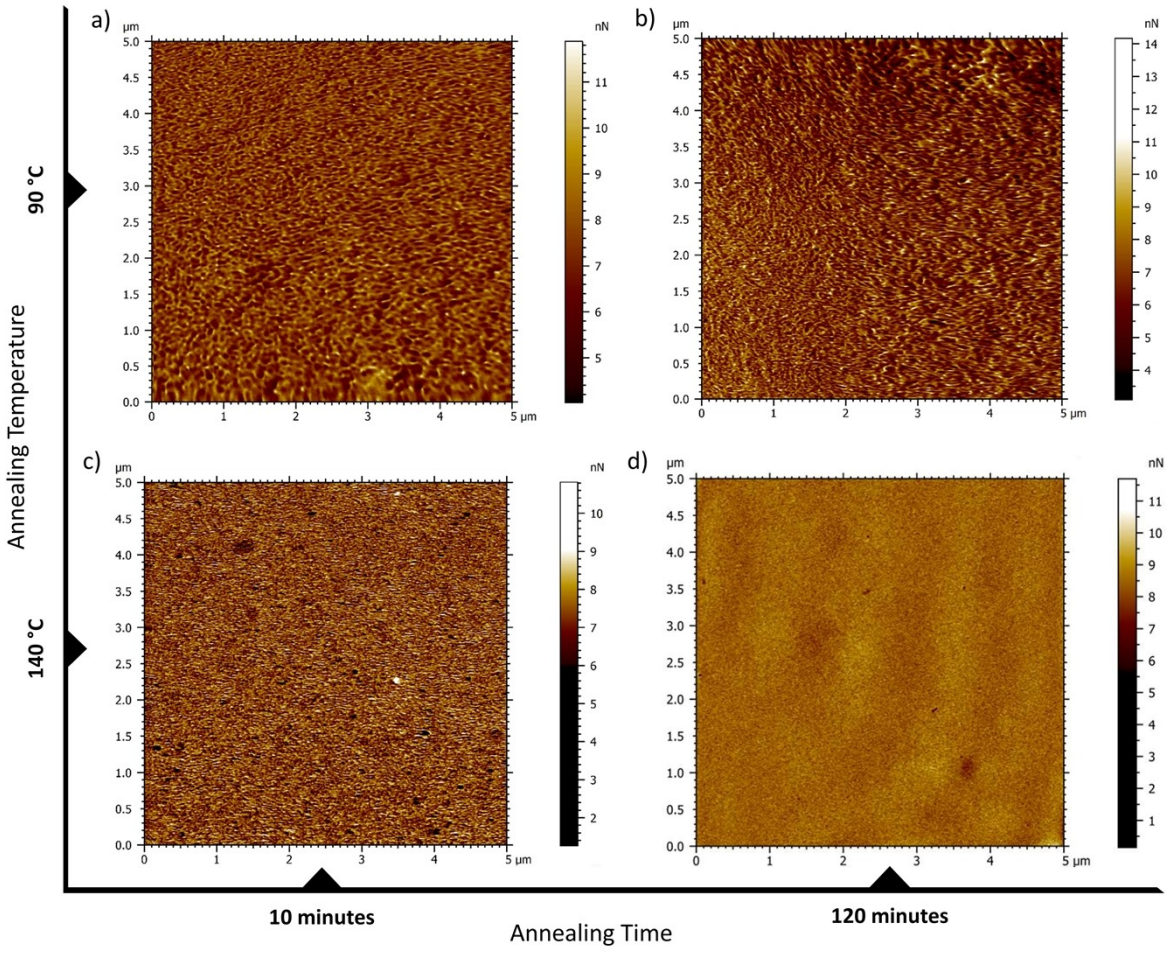

Figure SI4 Representative 5 µm x 5 µm adhesion maps of the channel region of 4 devices with L= 1.5 mm, and in a) T=90 °C and t=10 minutes, b) T=90 °C and t=120 minutes, c) T=140 °C and t=10 minutes, d) T=140 °C and t=120 minutes.

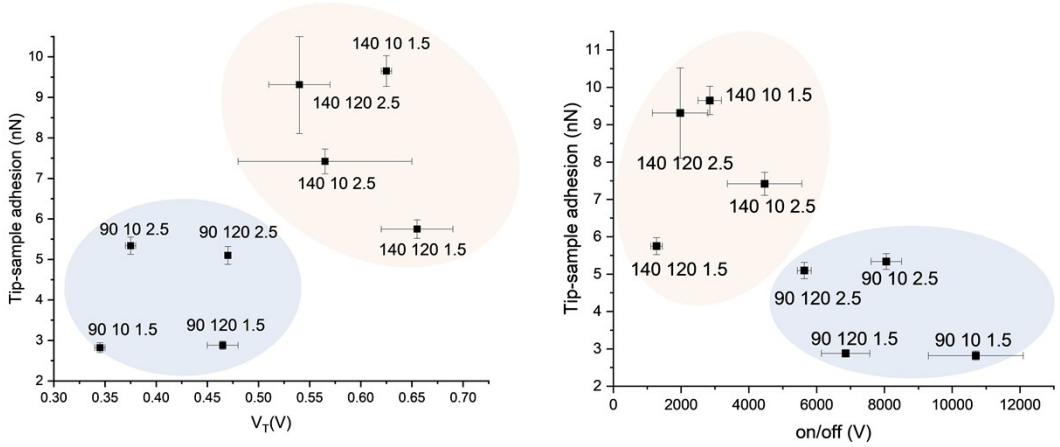

Figure SI5 The tip-surface adhesion of the OECTs measured with AFM plotted versus the on/off ratio (left) and the V_T (right). Blue is 90 °C, pink is 140 °C.