

Supporting Information

for

**PEDOT:PSS versus Polyaniline: A Comparative Study of Conducting
Polymers for Organic Electrochemical Transistors**

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General Measurements

A patterned electrode (BAS 0011598) was used as the substrate electrode of OECTs. A ultraviolet ozone cleaner (TECHNOVISION, INC. UV-208) was used to clean the substrate of OECTs. A spin coater used was MIKASA MS-B100. For thermal annealing, a digital hotplate of CORNING PC-400D was used. Output and transfer characteristics were measured using a parameter analyzer, KEITHLEY 4200A-SCS. Film thickness measurements were done with a surface profilometer, KLA-Tencor D-100. Atomic force microscopy (AFM) was measured by using an SPI3800N and SPA300 with a stiff cantilever DF-20.

Supporting Tables

Table S1 Characteristics of OECTs based on PEDOT:PSS

Sample	P1000- 5s	P1500- 5s	P2000- 5s	P2500- 5s	P3000- 5s	P2000- 0s	P2000- 5min	P2000- 15min	P2000- 1h	P2000- 18h
ON Resistance [Ω]	1400	1200	1160	1300	1470	940	1310	1350	1310	1080
Resistivity [$\Omega \cdot \text{m}$]	0.12	0.090	0.067	0.065	0.055	0.052	0.075	0.078	0.075	0.062
Conductivity [S/m]	8.16	11.1	15.0	15.4	18.1	19.3	13.3	12.9	13.3	16.1
Thickness [nm]	± 0.23	± 0.4	± 1.6	± 1.4	± 1.7	± 1.7	± 1.4	± 1.4	± 1.4	± 1.8
	350	300	230	200	150	220	230	230	230	230
	± 10	± 11	± 25	± 18	± 14	± 19	± 25	± 25	± 25	± 25

Table S2 Characteristics of OECTs based on PANI

Sample	PA1000- 5s	PA1500- 5s	PA2000- 5s	PA2500- 5s	PA3000- 5s	PA1500- 0s	PAD1500- 5s	PAD3000- 5s	PAD1500- 0s
ON Resistance [Ω]	2790	3380	3410	3750	3990	2920	3770	4710	4240
Resistivity [$\Omega \cdot \text{m}$]	1.10	1.13	0.96	0.98	0.98	0.83	0.91	0.99	1.29
Conductivity [S/m]	± 0.04	± 0.03	± 0.03	± 0.03	± 0.03	± 0.01	± 0.06	± 0.02	± 0.02
	0.91	0.88	1.05	1.03	1.02	1.20	1.09	1.01	0.77
Thickness [μm]	± 0.04	± 0.03	± 0.04	± 0.03	± 0.03	± 0.01	± 0.07	± 0.02	± 0.01
	1.57	1.34	1.12	1.04	0.98	1.14	0.97	0.84	1.22
	± 0.06	± 0.04	± 0.04	± 0.03	± 0.03	± 0.01	± 0.06	± 0.02	± 0.02

Table S3 Surface roughness (Ra) of PEDOT:PSS films

Sample	P1000-5s	P2000-5s	P3000-5s	P2000-0s	P2000-5min	P2000-15min	P2000-18h
1μm^2[nm]	2.72 ± 0.07	2.84 ± 0.09	2.47 ± 0.14	2.68 ± 0.20	2.56 ± 0.14	2.43 ± 0.12	1.73 ± 0.10
10μm^2[nm]	4.51 ± 0.52	4.62 ± 0.54	3.44 ± 0.34	3.83 ± 0.24	4.76 ± 0.43	3.05 ± 0.39	2.71 ± 0.16

Table S4 Surface roughness (Ra) of PANI films

Sample	PA1500-5s	PA3000-5s	PA1500-0s	PAD1500-5s	PAD3000-5s	PAD1500-0s
1μm^2[nm]	0.652 ± 0.03	0.764 ± 0.03	0.841 ± 0.05	0.761 ± 0.07	0.708 ± 0.04	0.784 ± 0.06
10μm^2[nm]	3.78 ± 1.49	3.94 ± 1.28	6.07 ± 1.45	3.17 ± 0.52	5.31 ± 1.19	1.78 ± 0.25

Supporting Figure

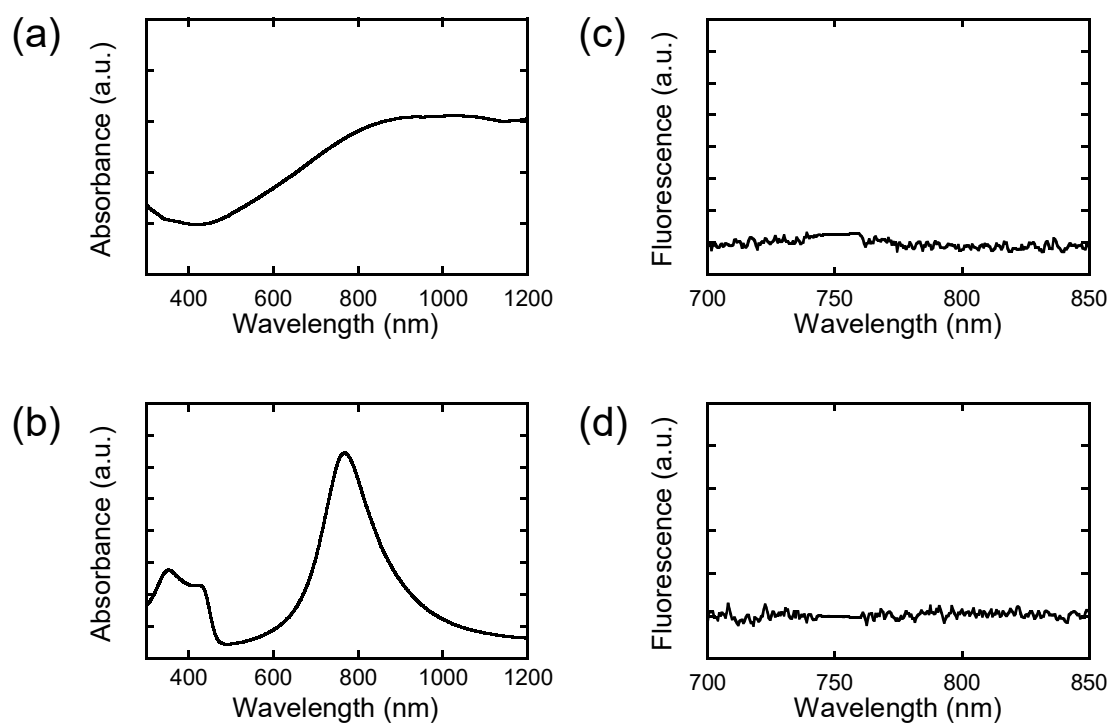


Figure S1 (a,b) Absorption and (c,d) fluorescence (excited at 750 nm) spectra of the thin films of (a,c) PEDOT:PSS and (b,d) PANI.