

A Step Towards the Processability of Insoluble or Partially soluble – Functional and Structural Variants of Polymers Based on 3,4-Alkylenedioxythiophene”

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Fig. S22 Optical switching studies for **P1b**:PSS

Fig. S23 Optical switching studies for **P1c**:PSS

Fig. S24 Optical switching studies for **P1e**:PSS

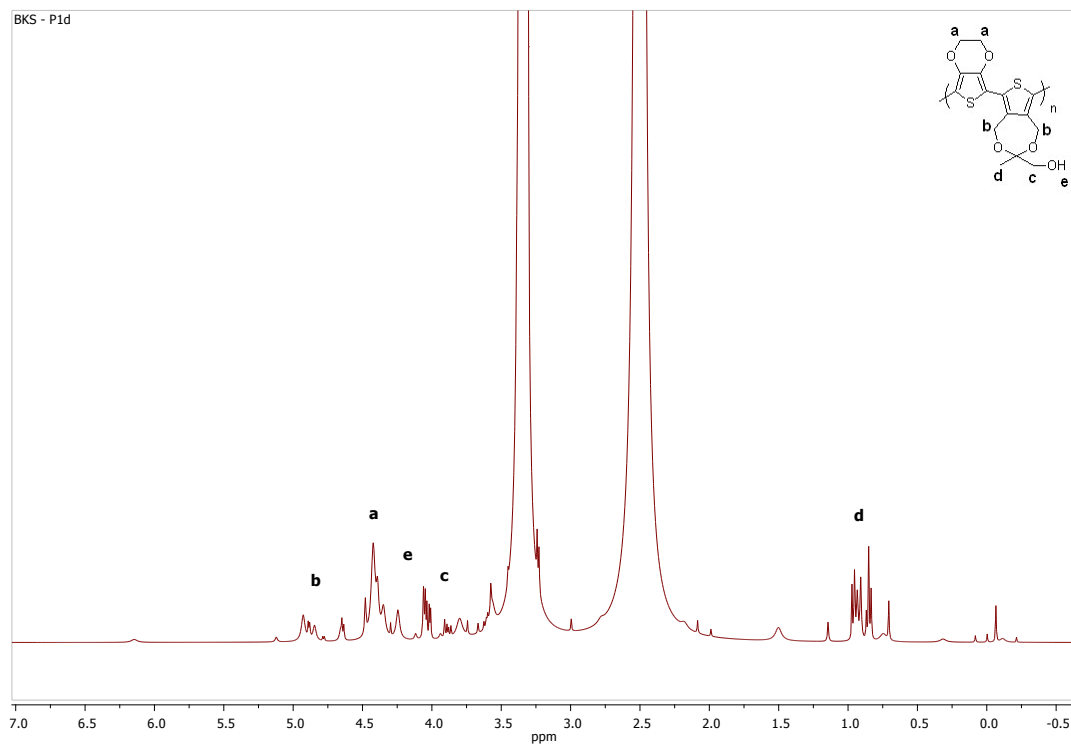


Fig. S1 ¹H NMR spectra of **P1d**.

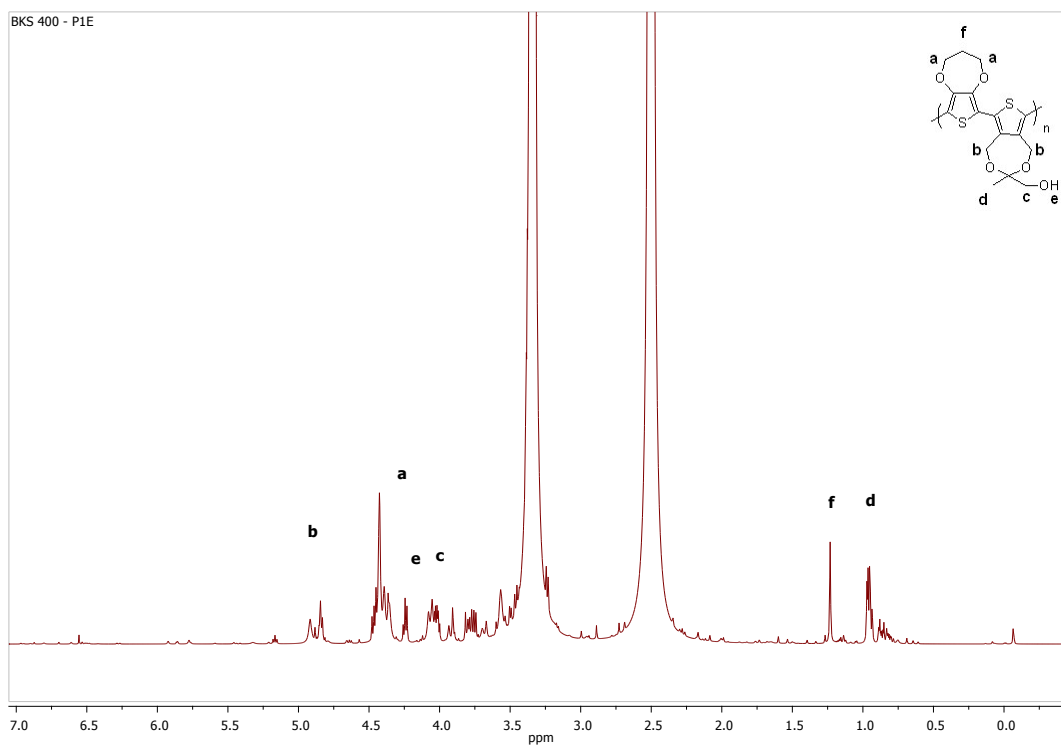


Fig. S2 ¹H NMR spectra of **P1e**.

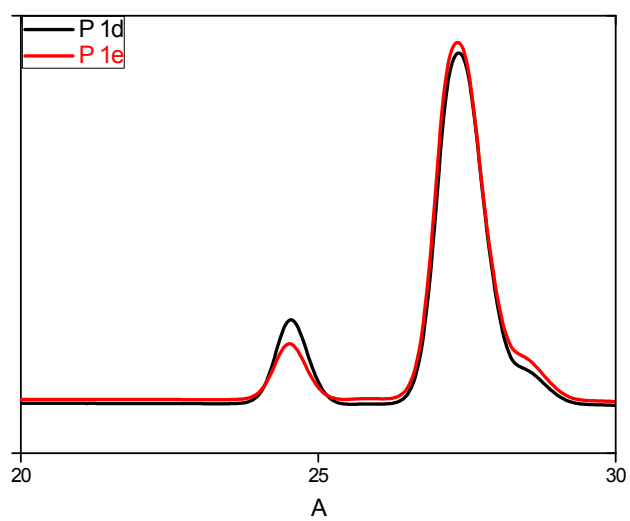


Fig. S3 GPC spectra of **P1d** and **P1e**.

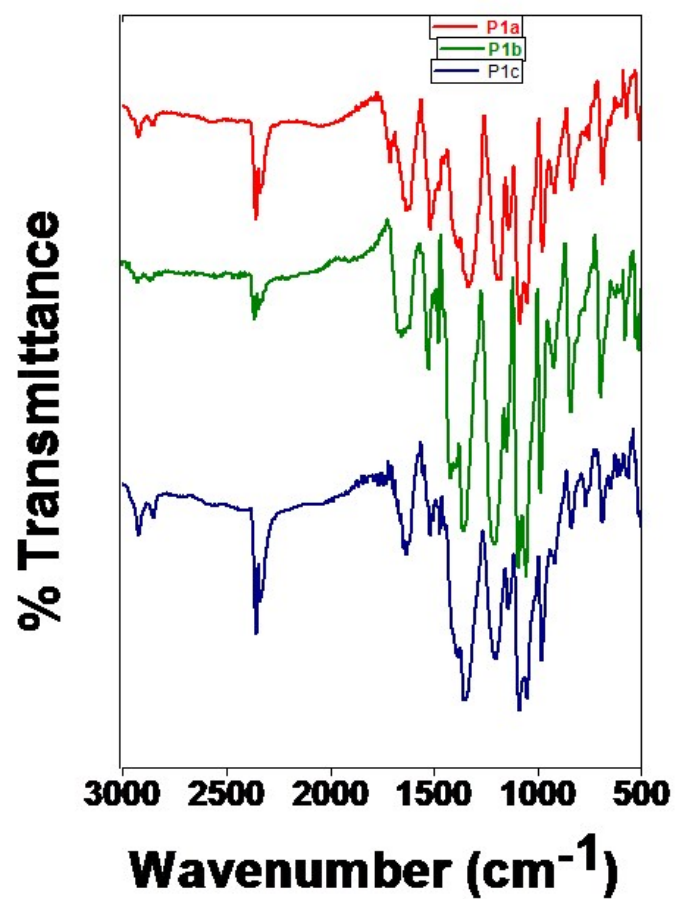


Fig. S4 FTIR spectra of P1(a-c).

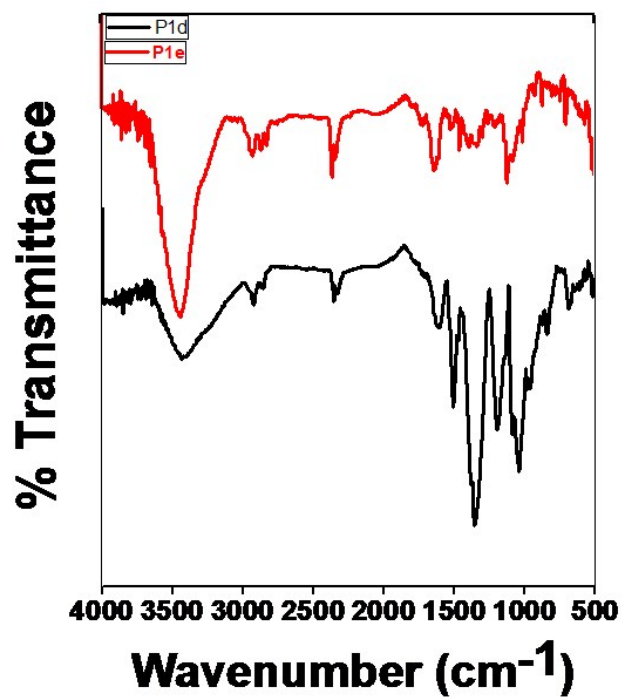


Fig. S5 FTIR spectra of P1d-e.

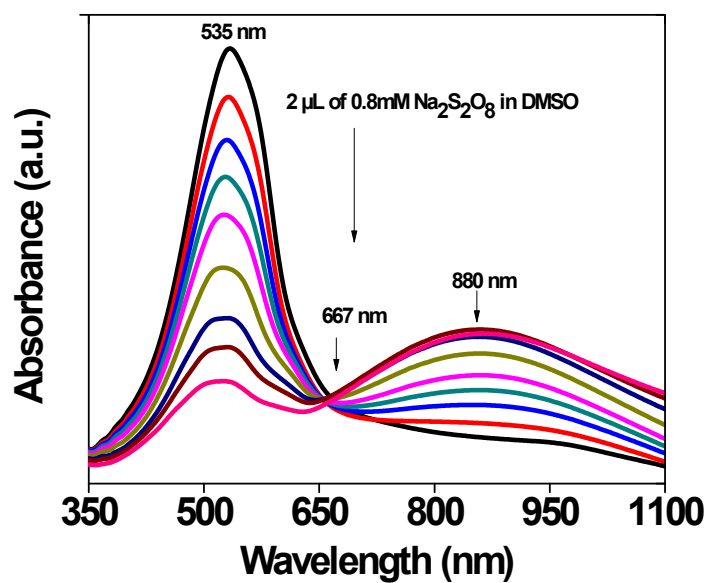


Fig. S6 Solution doping of **P1e** using 2 μL of 0.8 mM of Na₂S₂O₈ in DMSO as a dopant.

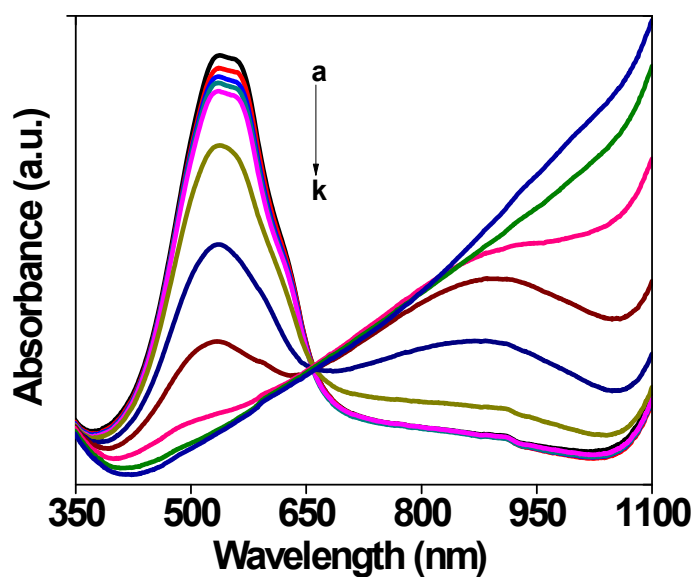
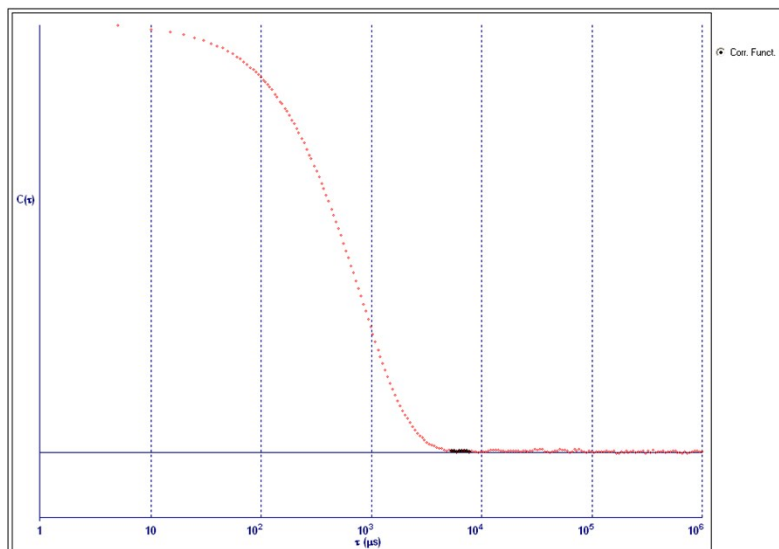


Fig. S7 Spectroelectrochemical spectra for **P1e** as a function of applied potential between -1 and +1 V in 0.1 M TBAP/ACN: (a) -1 V, (b) -0.8, (c) -0.6, (d) -0.4, (e) -0.2, (f) 0, (g) +0.2, (h) +0.4, (i) +0.6, (j) +0.8 (k) +1 V.

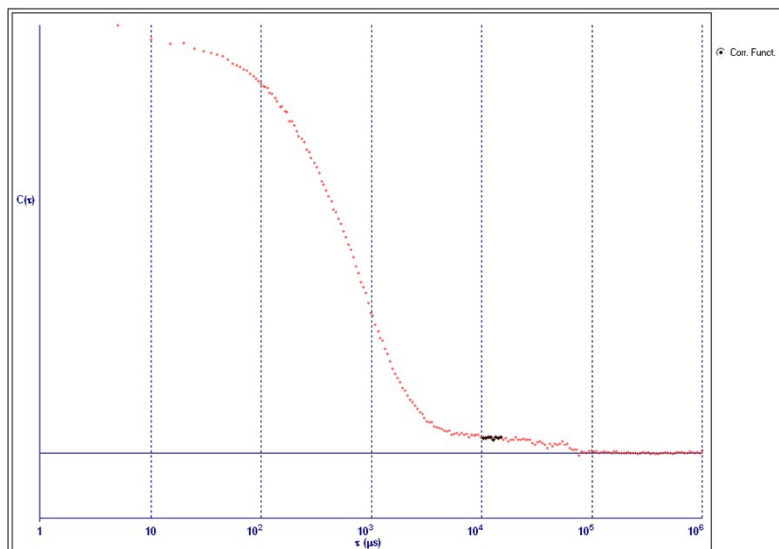
PEDOT/PSS final (Combined)
Effective Diameter: 430.5 nm
Polydispersity: 0.114
Avg. Count Rate: 164.1 kcps
Baseline Index: 9.1/ 96.49%
Elapsed Time: 00:05:00



Run	Eff. Diam. (nm)	Hall Width (nm)	Polydispersity	Baseline Index
1	421.3	153.9	0.133	10.0/ 86.69%
2	439.0	153.4	0.122	10.0/ 95.75%
3	429.1	145.4	0.115	9.7/100.00%
4	431.7	141.8	0.108	7.7/100.00%
5	427.6	161.7	0.143	10.0/100.00%
Mean	429.7	151.2	0.124	9.5/ 96.49%
Std. Error	2.9	3.5	0.006	0.4/ 2.58
Combined	430.5	145.3	0.114	9.1/ 96.49%

Fig. S8 Dynamic light scattering spectra for **P1a:PSS**

P(EDOT-ProDOT)-PSS (Combined)
Effective Diameter: 454.0 nm
Polydispersity: 0.220
Avg. Count Rate: 110.0 kcps
Baseline Index: 2.3/ 99.17%
Elapsed Time: 00:05:00



Run	Eff. Diam. (nm)	Hall Width (nm)	Polydispersity	Baseline Index
1	439.0	182.8	0.173	0.0/100.00%
2	437.3	215.9	0.244	1.0/100.00%
3	450.4	209.9	0.217	1.9/ 95.83%
4	454.3	187.5	0.170	2.9/100.00%
5	454.4	212.7	0.219	0.0/100.00%
Mean	447.1	201.8	0.205	1.3/ 99.17%
Std. Error	3.7	6.9	0.014	0.6/ 0.83
Combined	454.0	212.9	0.220	2.3/ 99.17%

Fig. S9 Dynamic light scattering spectra for **P1b:PSS**

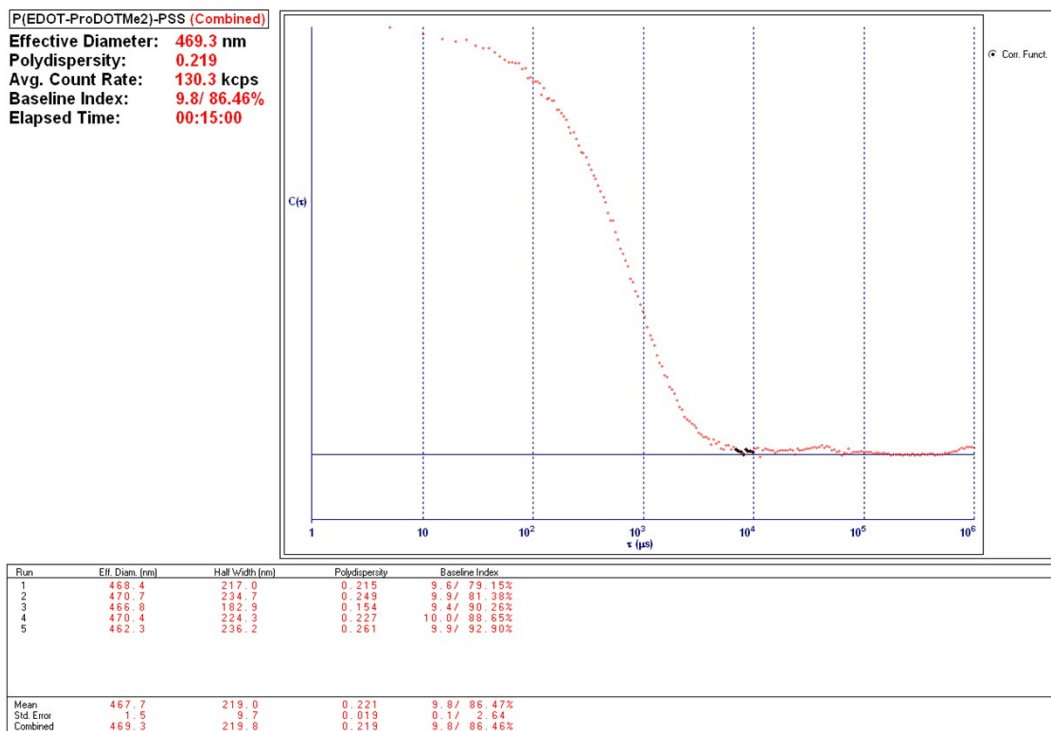


Fig. S10 Dynamic light scattering spectra for **P1c:PSS**

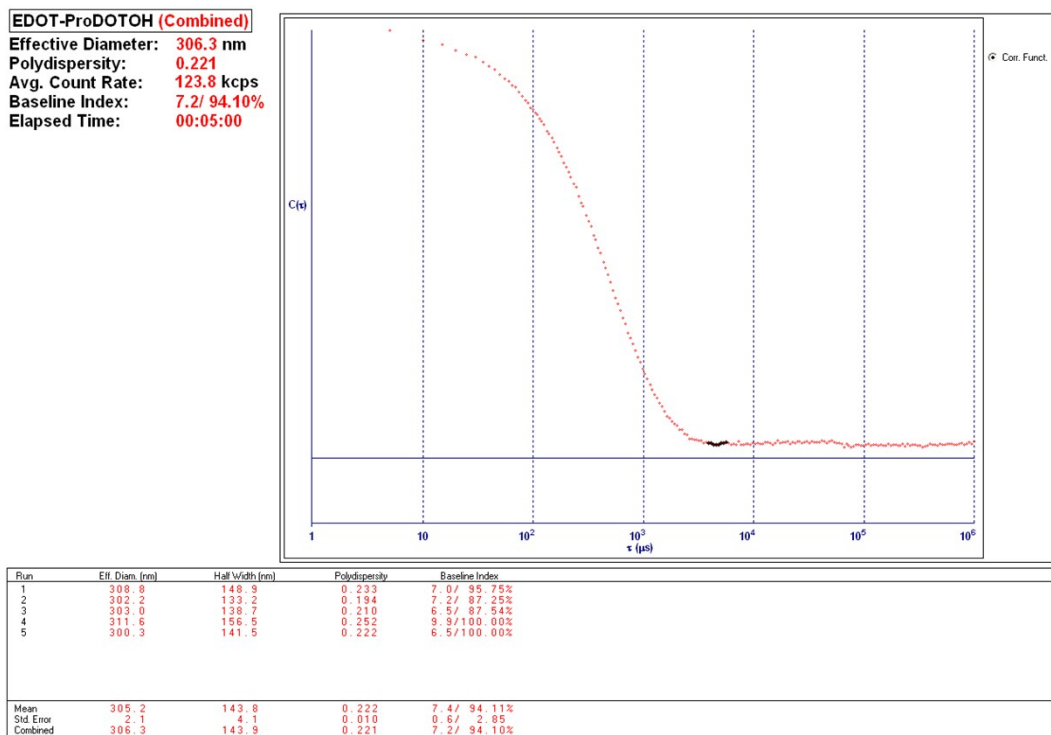


Fig. S11 Dynamic light scattering spectra for **P1d:PSS**

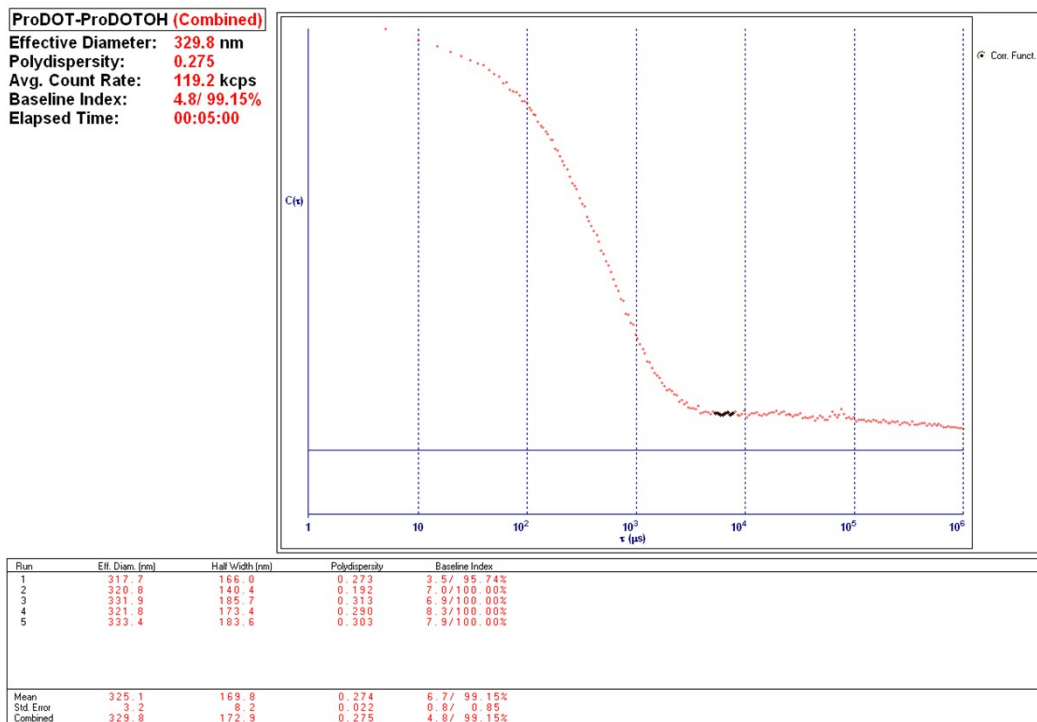


Fig. S12 Dynamic light scattering spectra for **P1e:PSS**

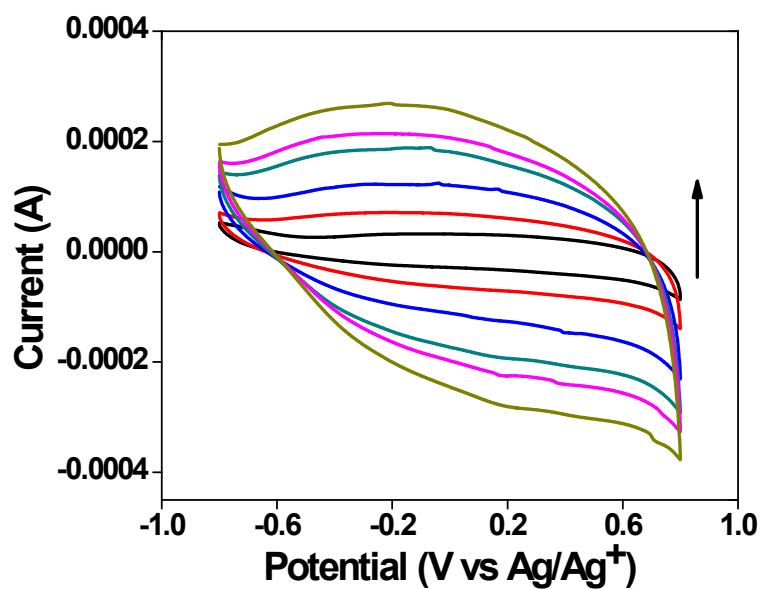


Fig. S13 Cyclic voltammogram of **P1a:PSS** in 0.1 M TBAP/ACN at scan rate of (a) 25 mV/s, (b) 50 mV/s, (c) 75 mV/s, (d) 100 mV/s, (e) 125 mV/s and (f) 150 mV/s.

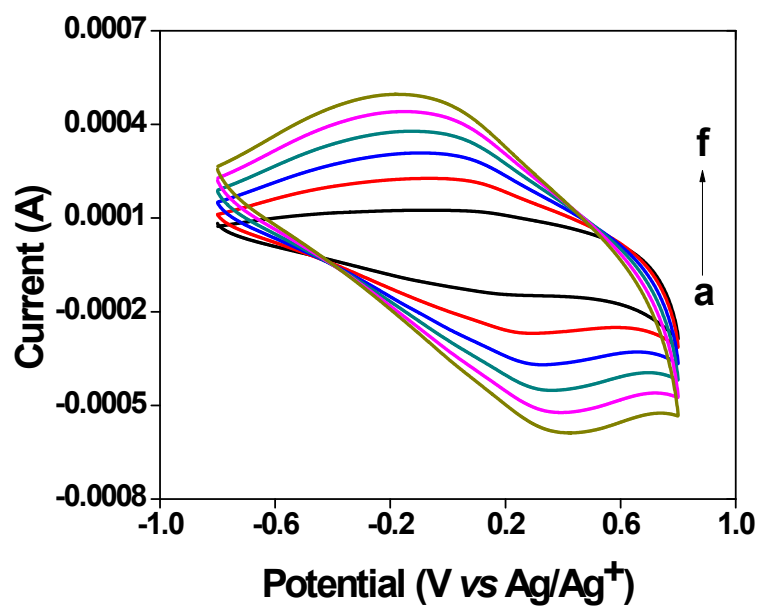


Fig. S14 Cyclic voltammogram of **P1b**:PSS in 0.1 M TBAP/ACN at scan rate of (a) 25 mV/s, (b) 50 mV/s, (c) 75 mV/s, (d) 100 mV/s, (e) 125 mV/s and (f) 150 mV/s.

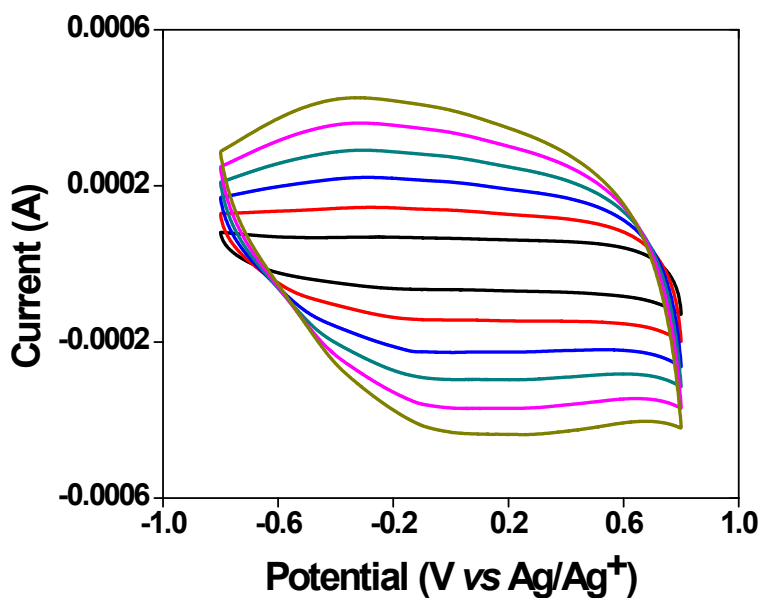


Fig. S15 Cyclic voltammogram of **P1c**:PSS in 0.1 M TBAP/ACN at scan rate of (a) 25 mV/s, (b) 50 mV/s, (c) 75 mV/s, (d) 100 mV/s, (e) 125 mV/s and (f) 150 mV/s.

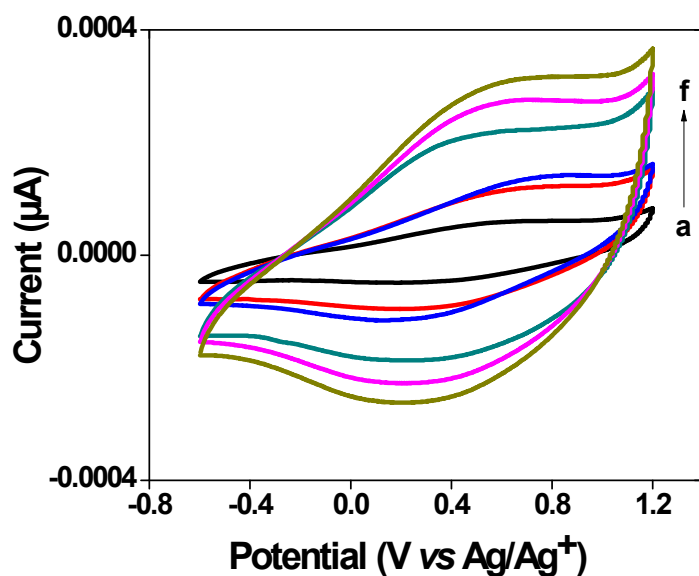


Fig. S16 Cyclic voltammogram of **P1e:PSS** in 0.1 M TBAP/ACN at scan rate of (a) 25 mV/s, (b) 50 mV/s, (c) 75 mV/s, (d) 100 mV/s, (e) 125 mV/s and (f) 150 mV/s.

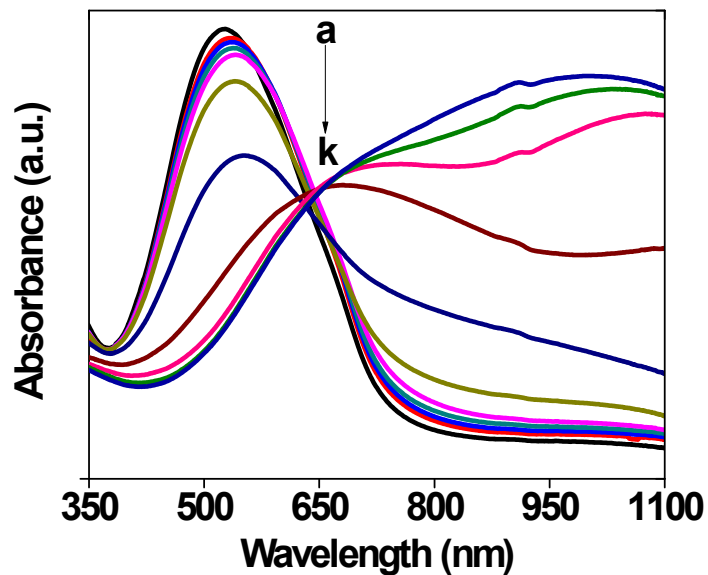


Fig. S17 Spectroelectrochemical spectra for **P1a:PSS** as a function of applied potential between -1 V and +1 V in 0.1 M TBAP/ACN: (a) -1 V, (b) -0.8, (c) -0.6, (d) -0.4, (e) -0.2, (f) 0, (g) +0.1, (h) +0.2, (i) +0.3 (j) +0.8 (k) +1 V.

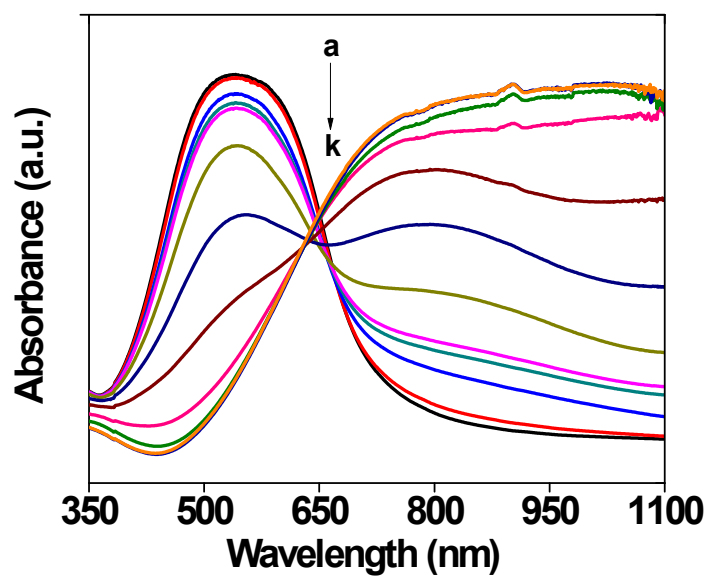


Fig. S18 Spectroelectrochemical spectra for **P1b:PSS** as a function of applied potential between -1 V and +1 V in 0.1 M TBAP/ACN: (a) -1 V, (b) -0.8, (c) -0.6, (d) -0.4, (e) -0.2, (f) 0, (g) +0.1, (h) +0.2, (i) +0.3 (j) +0.8 (k) +1 V.

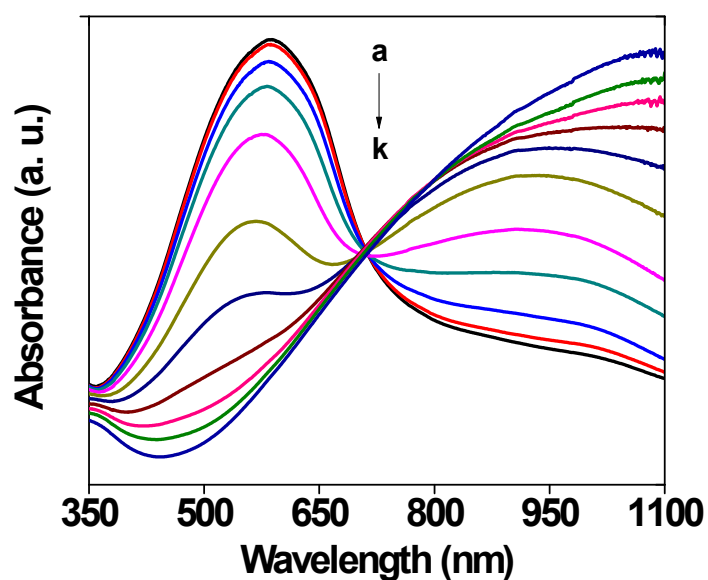


Fig. S19 Spectroelectrochemical spectra for **P1c:PSS** as a function of applied potential between -1 V and +1 V in 0.1 M TBAP/ACN: (a) -1 V, (b) -0.8, (c) -0.6, (d) -0.4, (e) -0.2, (f) 0, (g) +0.1, (h) +0.2, (i) +0.3 (j) +0.8 (k) +1 V.

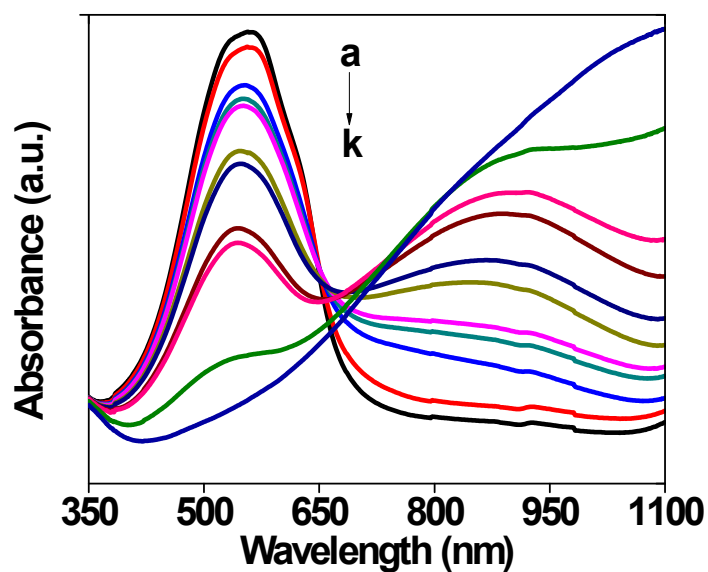


Fig. S20 Spectroelectrochemical spectra for **P1e:PSS** as a function of applied potential between -1 V and +1 V in 0.1 M TBAP/ACN: (a) -1 V, (b) -0.8, (c) -0.6, (d) -0.4, (e) -0.2, (f) 0, (g) +0.1, (h) +0.2, (i) +0.3 (j) +0.8 (k) +1 V.

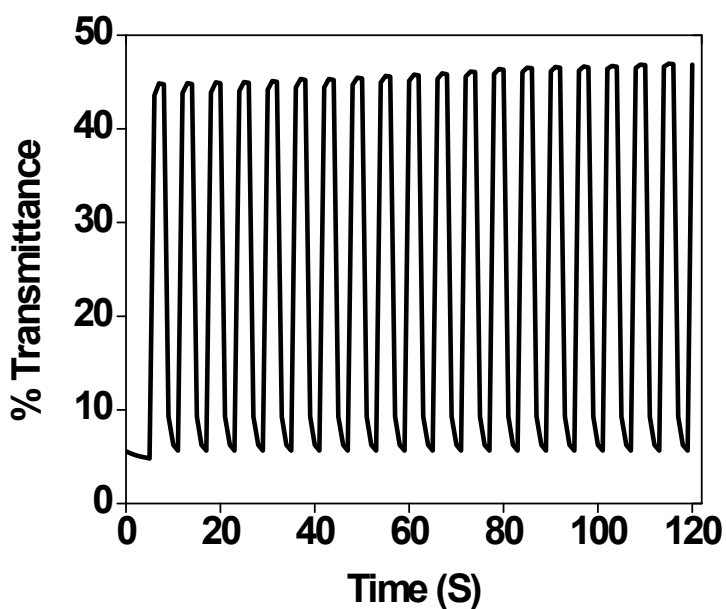


Fig. S21 Optical switching studies for **P1a:PSS** film deposited by spin coating monitored at 525 nm, when it was stepped between its reduced (-1.0 V) and oxidized (+1.0 V) state.

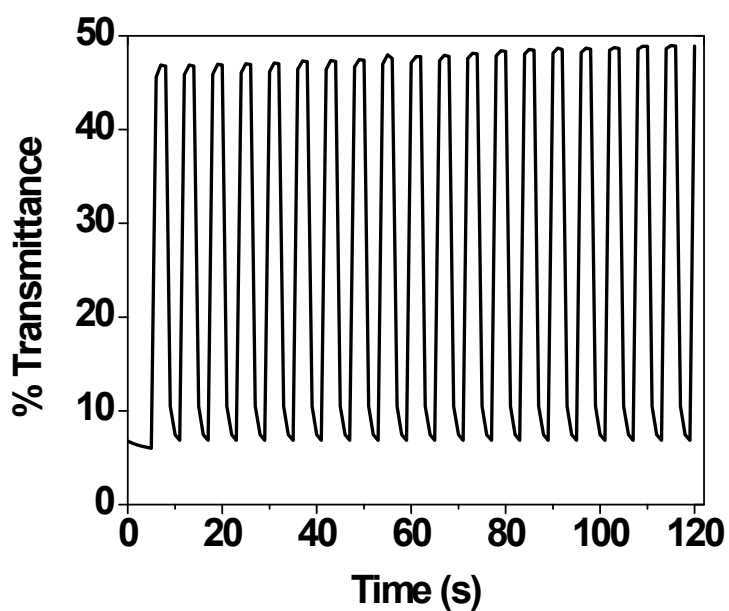


Fig. S22: Optical switching studies for **P1b**:PSS film deposited by spin coating monitored at 540 nm, when it was stepped between its reduced (-1.0 V) and oxidized (+1.0 V) state.

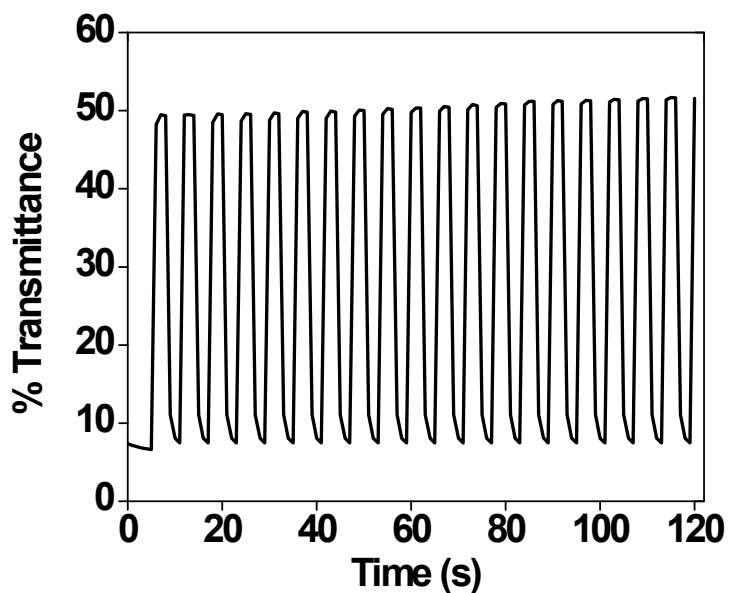


Fig. S23 Optical switching studies for **P1c**:PSS film deposited by spin coating monitored at 585 nm, when it was stepped between its reduced (-1.0 V) and oxidized (+1.0 V) state.

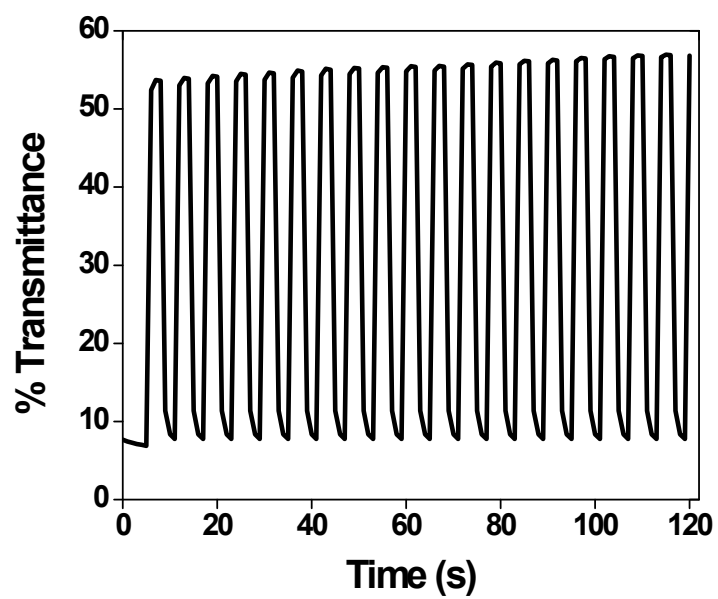


Fig. S24 Optical switching studies for **P1e:PSS** film deposited by spin coating monitored at 555 nm, when it was stepped between its reduced (-1.0 V) and oxidized (+1.0 V) state.