

Supporting Information

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Electrochemical characterization of the solvent-enhanced conductivity of poly(3,4-ethylenedioxythiophene) and its application in polymer solar cells

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The amount of migration for Li^+ and ClO_4^- is calculated from the results of molar flux (Figure 3). With the values of the amount of migration for Li^+ and ClO_4^- we can estimate the x_R and x_O from Eq. 8 and Eq. 9 in the paper, respectively. Therefore, we can calculate the amount of accumulated ion pair per electron (Table 2) according to the values of x_R and x_O . The detail information about the amount of migration for Li^+ and ClO_4^- , x_R and x_O is shown in the following Table.

Table S1. The calculated amount of migration for Li^+ and ClO_4^- , x_R and x_O for the PEDOT stepped in 0.1 M $\text{LiClO}_4/\text{ACN}$.

0.3 to -0.9 V				
Cycle number	Li^+ (nmol)	ClO_4^- (nmol)	x_{ri}	$(x_{ri}-1)$
1	7.85	-2.91	0.729486	-0.270511
2	7.28	-2.62	0.734834	-0.26517
3	7.12	-2.50	0.740048	-0.259950
4	7.06	-2.38	0.747485	-0.252511
5	7.00	-2.22	0.758643	-0.241362
10	6.93	-1.94	0.781130	-0.218873
50	6.83	-1.67	0.802868	-0.197131
100	5.33	-1.56	0.773585	-0.226420
-0.9 to 0.3 V				
Cycle number	Li^+ (nmol)	ClO_4^- (nmol)	x_{oi}	$(x_{oi}+1)$
1	-1.48	3.51	-0.296734	0.703266
2	-1.98	3.17	-0.384466	0.615534
3	-2.28	3.03	-0.429700	0.570299
4	-2.40	2.98	-0.446919	0.553081
5	-2.50	2.83	-0.469242	0.530758
10	-2.72	2.41	-0.530763	0.469237
50	-3.37	1.99	-0.628731	0.371269
100	-2.73	1.66	-0.621867	0.378132

Table S2. The calculated amount of migration for Li^+ and ClO_4^- , x_R and x_O for the PEDOT stepped in 0.1 M $\text{LiClO}_4/\text{DMF}$.

0.3 to -0.9 V				
Cycle number	Li^+ (nmol)	ClO_4^- (nmol)	x_{ri}	$(x_{ri}-1)$
1	5.219	-1.07	0.829994	-0.170011
2	4.78	-1.09	0.81431	-0.185693
3	4.65	-1.09	0.810105	-0.189910
4	4.51	-1.18	0.792619	-0.207380
5	4.44	-1.12	0.798561	-0.201445
10	4.24	-1.12	0.791045	-0.208962
50	4.24	-1.12	0.791045	-0.208961
100	3.99	-1.04	0.793241	-0.206760
-0.9 to 0.3 V				
Cycle number	Li^+ (nmol)	ClO_4^- (nmol)	x_{oi}	$(x_{oi}+1)$
1	-1.77	2.33	-0.431990	0.568010
2	-2.6	1.97	-0.568927	0.431072
3	-3.08	1.68	-0.647058	0.352941
4	-3.25	1.58	-0.672877	0.327122
5	-3.33	1.47	-0.693757	0.306251
10	-3.47	1.33	-0.703932	0.296067
50	-3.61	1.23	-0.745867	0.254132
100	-3.57	1.02	-0.778129	0.221871

Table S3. The calculated amount of migration for Li^+ and ClO_4^- , x_R and x_O for the PEDOT stepped in 0.1 M LiClO_4/EG .

0.3 to -0.9 V				
Cycle number	Li^+ (nmol)	ClO_4^- (nmol)	x_{ri}	$(x_{ri}-1)$
1	6.26	-5.52	0.531545	-0.468460
2	5.69	-5.12	0.526364	-0.473640
3	5.61	-4.84	0.536842	-0.463160
4	5.55	-4.67	0.543053	-0.456950
5	5.67	-4.47	0.559172	-0.440830
10	5.72	-3.98	0.589691	-0.410310
50	5.73	-3.54	0.618123	-0.381880
100	5.8	-2.91	0.665901	-0.334101
-0.9 to 0.3 V				
Cycle number	Li^+ (nmol)	ClO_4^- (nmol)	x_{oi}	$(x_{oi}+1)$
1	-2.14	7.86	-0.214110	0.786110
2	-3.92	6.03	-0.393969	0.606031
3	-4.53	5.26	-0.462717	0.537283
4	-4.75	4.94	-0.490196	0.509804
5	-5.05	4.64	-0.521155	0.478844
10	-5.43	4.02	-0.574603	0.425397
50	-5.56	3.49	-0.614019	0.385981
100	-5.66	2.90	-0.662778	0.337222

Table S4. The calculated amount of migration for Li^+ and ClO_4^- , x_R and x_O for the PEDOT stepped in 0.1 M $\text{LiClO}_4/\text{DMSO}$.

0.3 to -0.9 V				
Cycle number	Li^+ (nmol)	ClO_4^- (nmol)	x_{ri}	$(x_{ri}-1)$
1	9.11	-2.2	0.805482	-0.194523
2	8.68	-1.47	0.855172	-0.144830
3	8.31	-1.01	0.891631	-0.108372
4	8.1	-0.67	0.923603	-0.076411
5	7.88	-0.52	0.938095	-0.061910
10	7.75	-0.48	0.941677	-0.058322
50	7.69	-0.45	0.944717	-0.055281
100	7.61	-0.41	0.948878	-0.051120
-0.9 to 0.3 V				
Cycle number	Li^+ (nmol)	ClO_4^- (nmol)	x_{oi}	$(x_{oi}+1)$
1	-1.93	2.02	-0.488607	0.511392
2	-2.73	1.05	-0.722222	0.277778
3	-2.79	0.62	-0.818181	0.181818
4	-2.71	0.31	-0.900332	0.099668
5	-3.43	0.27	-0.927095	0.072905
10	-3.46	0.25	-0.932677	0.067323
50	-3.43	0.22	-0.939717	0.060283
100	-3.38	0.19	-0.946878	0.053122