

Tuning the photo-luminescence and anisotropic structure of PEDOT

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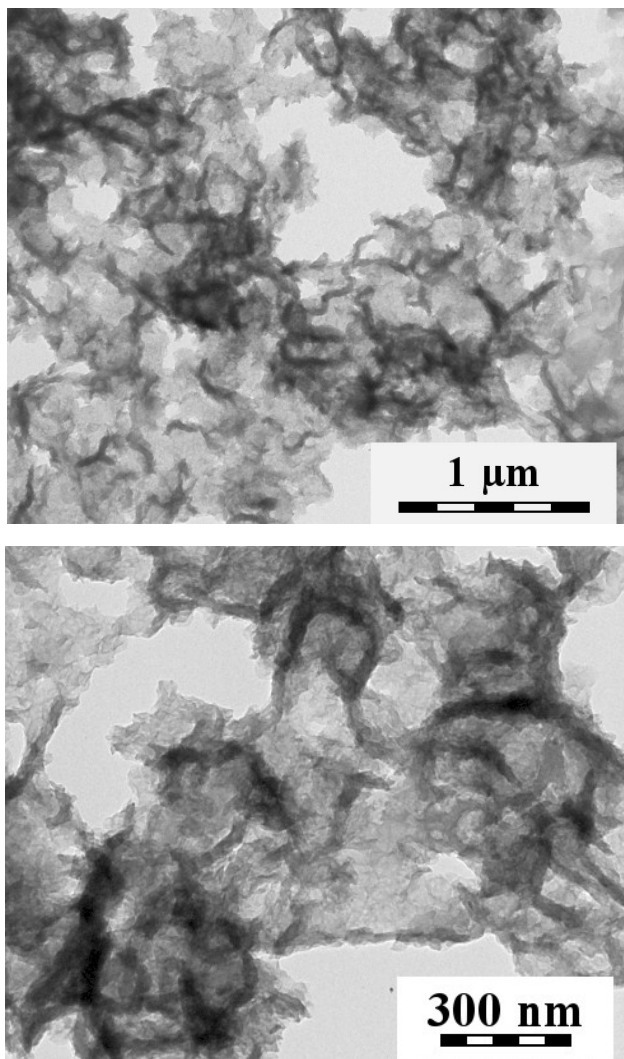


Fig. S1 TEM of PEDOT suspension in aqueous solution of 5M formic acid.

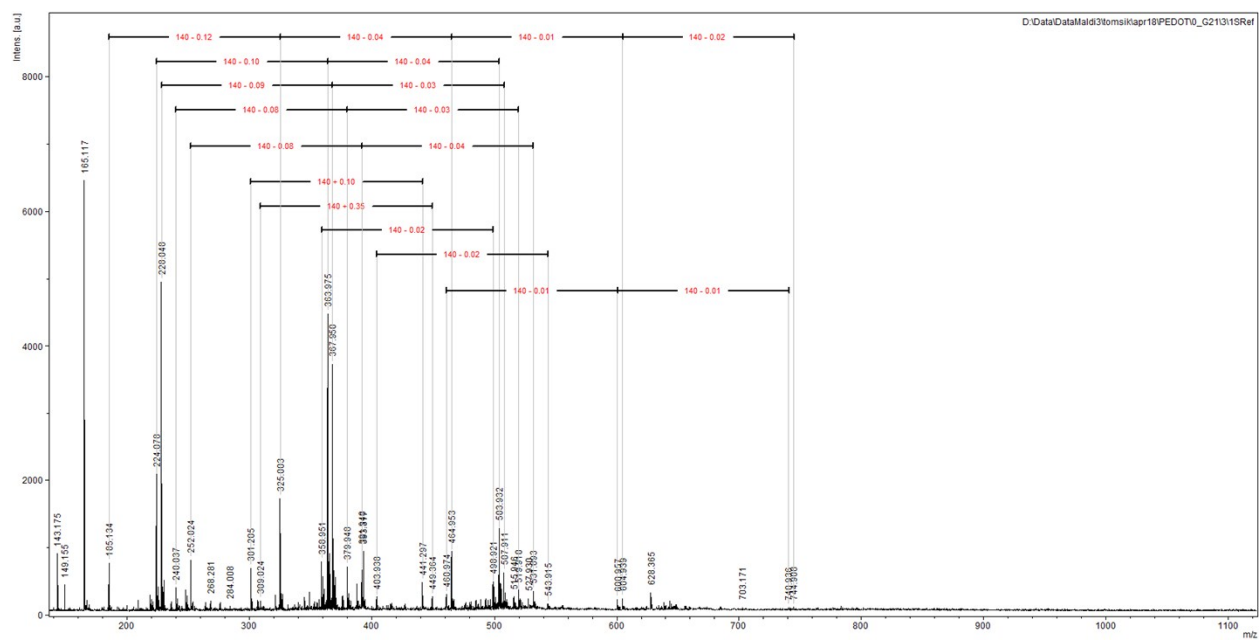


Fig. S2 MALDI ToF measurements of PEDOT.

Table S1. Position of the binding energy of core-level S 2p and C 1s of PEDOT.

Reference	Binding energy, eV					
	S 2p ^{3/2}	S 2p ^{1/2}	=CH-S-	=C-O-	-CH ₂ -O-	Shake-up
[1]	163.8	164.9	–	–	–	–
[2]	163.9	165	–	–	–	–
our work	163.2	164.5	284.2	288.4	286	
[3]	164	165.1	285.3	286.3	287	–
[4]	163.9	–	285.3	286.1	286.9	287.7

Reference:

[1] Y. Jin, Q. Chen, and P. Lessner, *Electrochemistry*, 2013, 81, 801.

[2] T.Y. Kim, C.M. Park, J.E. Kim, K.S. Suh, *Synthet. Met.*, 2005, 149, 169.

[3] S.A. Spanninga, D.C. Martin, and Z. Chen, *J. Phys. Chem. C*, 2009, 113, 5585.

[4] S.K.M. Jönsson, M.P. de Jong, L. Groenendaal, W.R. Salaneck, and M. Fahlman, *J. Phys. Chem. B*, 2003, 107, 10793.

Table S2 Composition of PEDOT film determined by XPS.

	Atomic %
S	8.88
=C-S-	25.76
=C-O-	19.69
-CH₂-O-	19.67
-O-C=O	1.05
O=C	0.98
-O-	23.97
Cl	0.96
N	0.50

As can be seen from Table S2, the ratio of S to -O-C=O (formate ion) is 8. It means that each eight monomer unit has one formate ion.

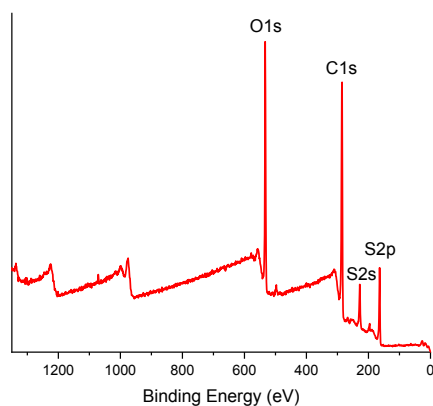


Fig. S3 Survey XPS spectrum of PEDOT film as deposited on FTO electrode.

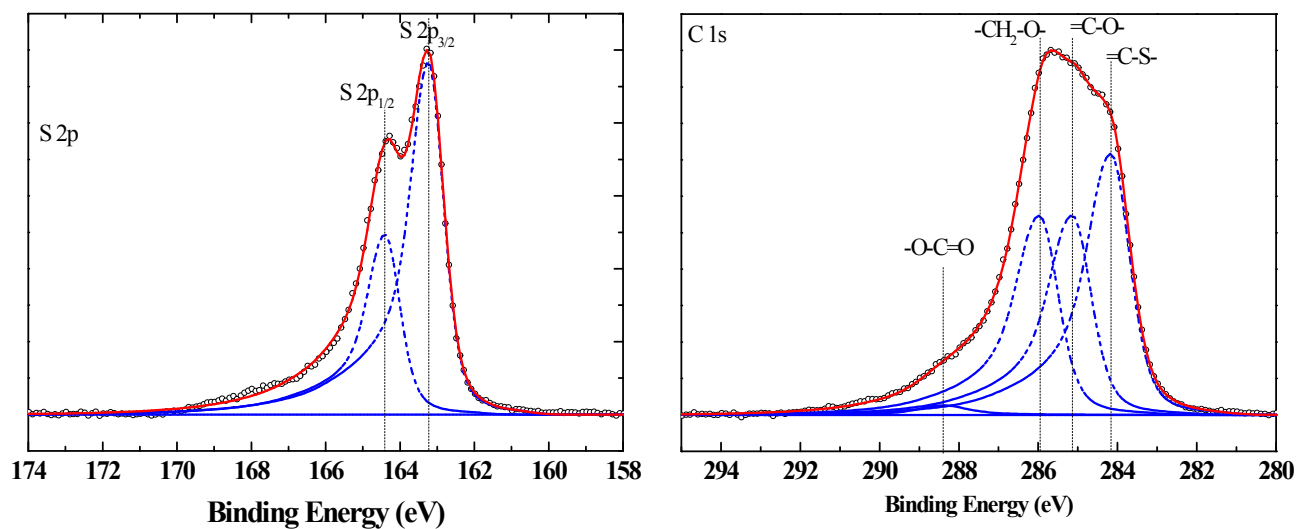


Fig. S4 High resolution core-level S 2p (left) and C 1s (right) XPS spectra of PEDOT film after electrochemical cyclic voltammetry measurements.

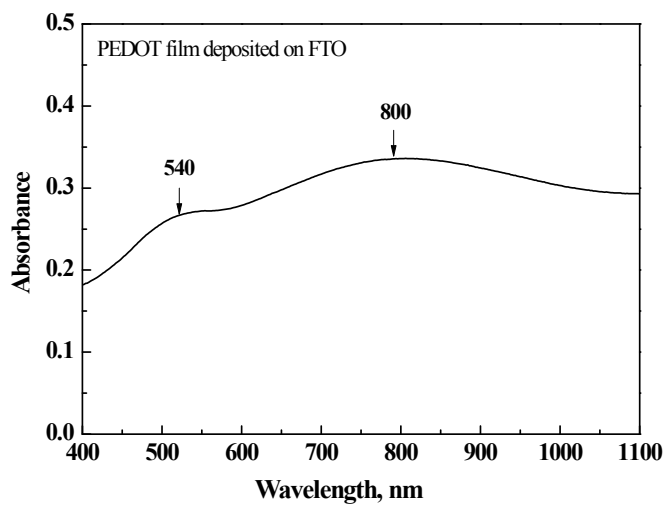


Fig. S5 UV-Vis spectra of PEDOT film.

The UV-visible specter reveals the two broad maximum at 540 nm (corresponding to de-doped units) and 800 nm (corresponding to doped units).

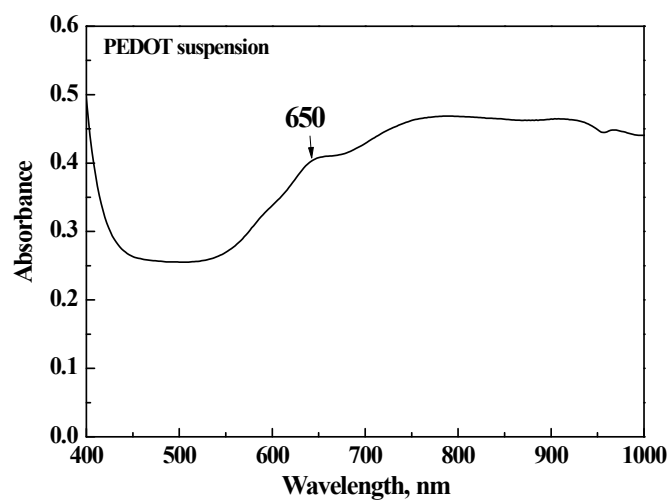


Fig. S6 UV-Vis spectra of PEDOT suspension.

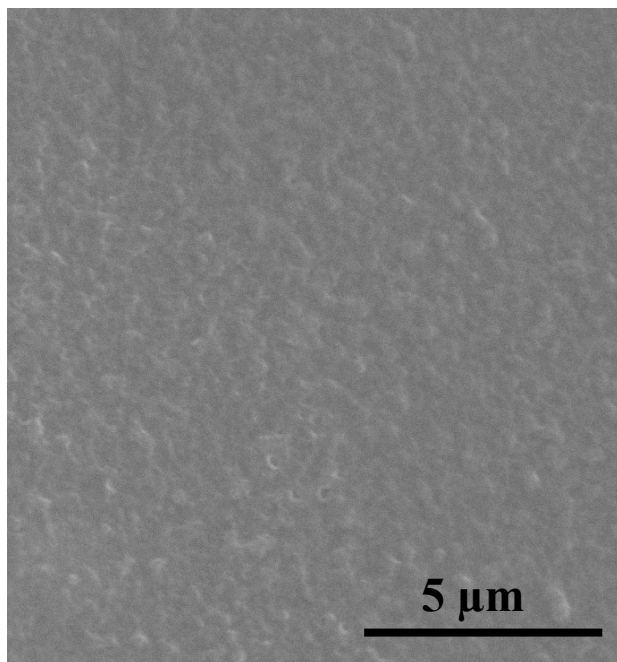


Fig. S7 Scanning electron microscopy image of PEDOT film deposited on FTO electrode after cyclic voltammetry measurements.