Electronic Supplementary Information

Deterioration Mechanism of Electrochromic poly (3,4-(2,2 dimethylpropylenedioxy) thiophene) Thin Films

Shian Guan,[a] Ayman S. Elmezayyen,[a] Feifei Zhang,[a] Jianming Zheng[a] and Chunye Xu[a,b]

a. Hefei National Laboratory for Physical Sciences at the Microscale, University of Science and Technology of China, Hefei, 230026, P. R. China.

b. CAS Key Lab of Soft Matter Chemistry, Department of Polymer Science and Engineering, University of Science and Technology of China, Hefei, 230026, P. R. China.

*Corresponding author

E-mail address: chunye@ustc.edu.cn.

Figure S1

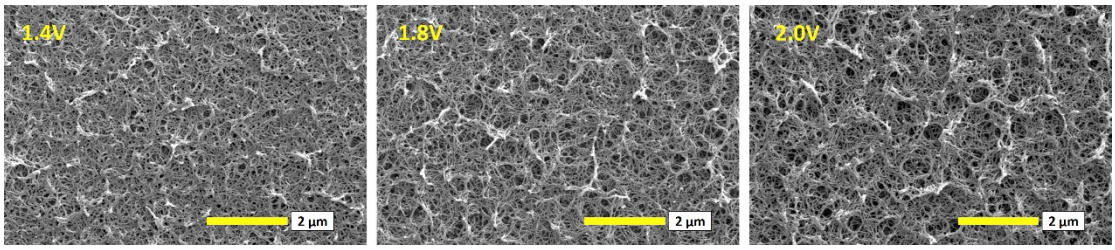

Fig. S1. SEM images of PProDot-Me_2 film under different polymerization voltage (1.4V, 1.8V and 2.0V) (vs. Ag/Ag^+) with growth time for 4 s polymerized in 0.1 M $LiClO_4$/PC electrolyte.

Figure S2

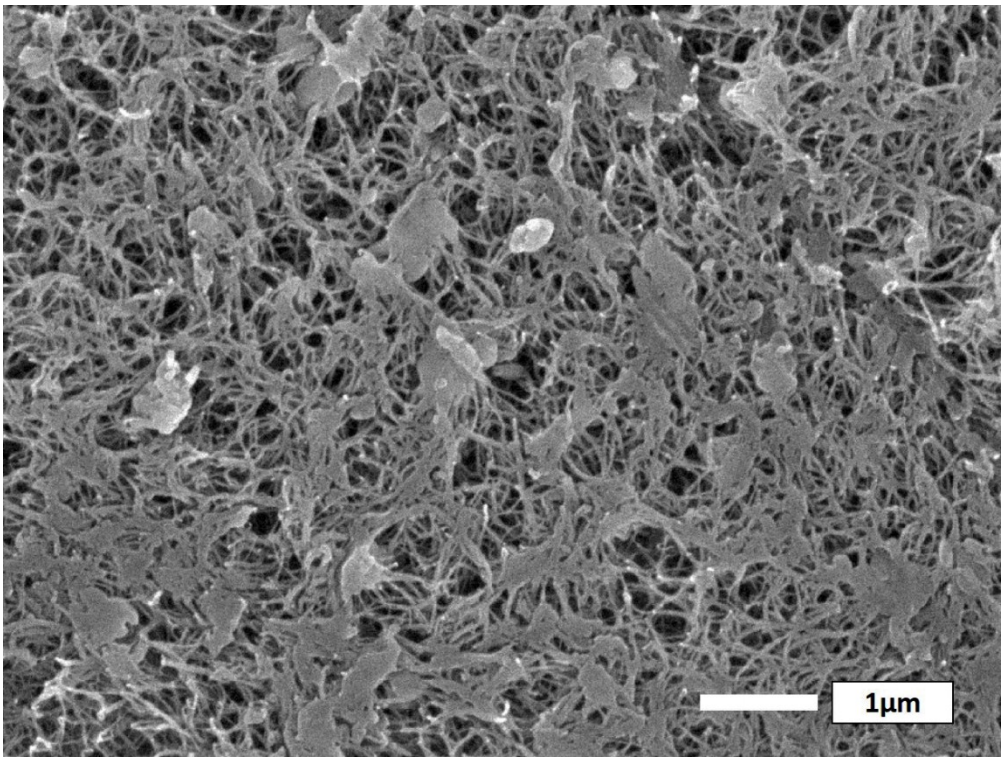

Fig. S2. SEM images of PProDot-Me_2 film with growth time for 20 s polymerized in 0.1M $LiClO_4$/PC electrolyte at Eg=1.65 V (vs. Ag/Ag^+).

Figure S3

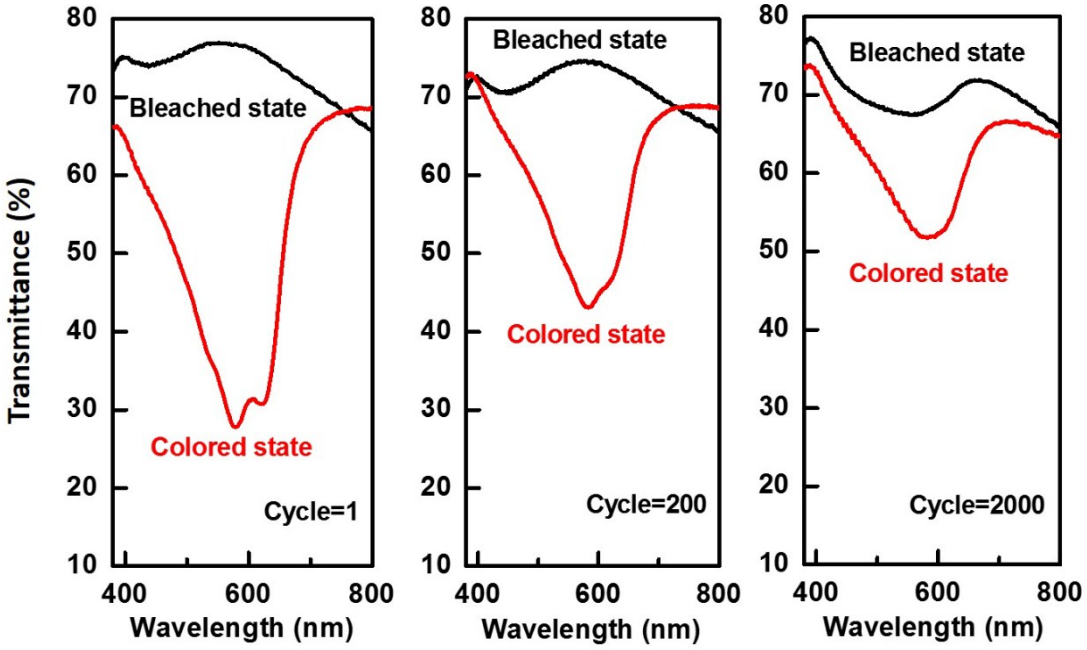

Fig. S3. Transmittances of PProDOT-Me_2 films with different cycles (cycle=1, 200, 2000) under the condition of ±1.2V within 3.0s in 0.1M $LiClO_4$/PC electrolyte.

Figure S4

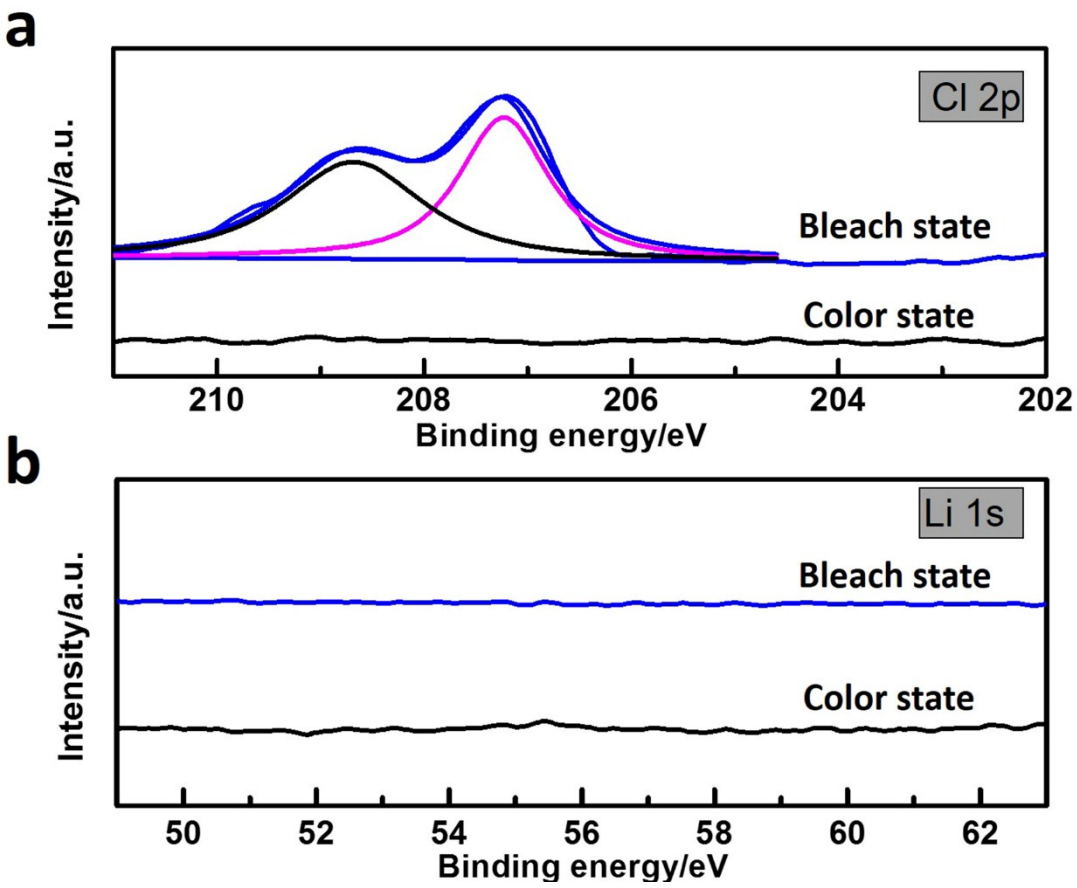

Fig. S4. Cl2p and Li1s spectra of PProDOT-Me_2 film after 40k cycles under the operating condition of ± 0.3 V (vs. Ag/Ag^+) within 1.0 s in 0.0125 M $LiClO_4$/PC electrolyte.

Figure S4

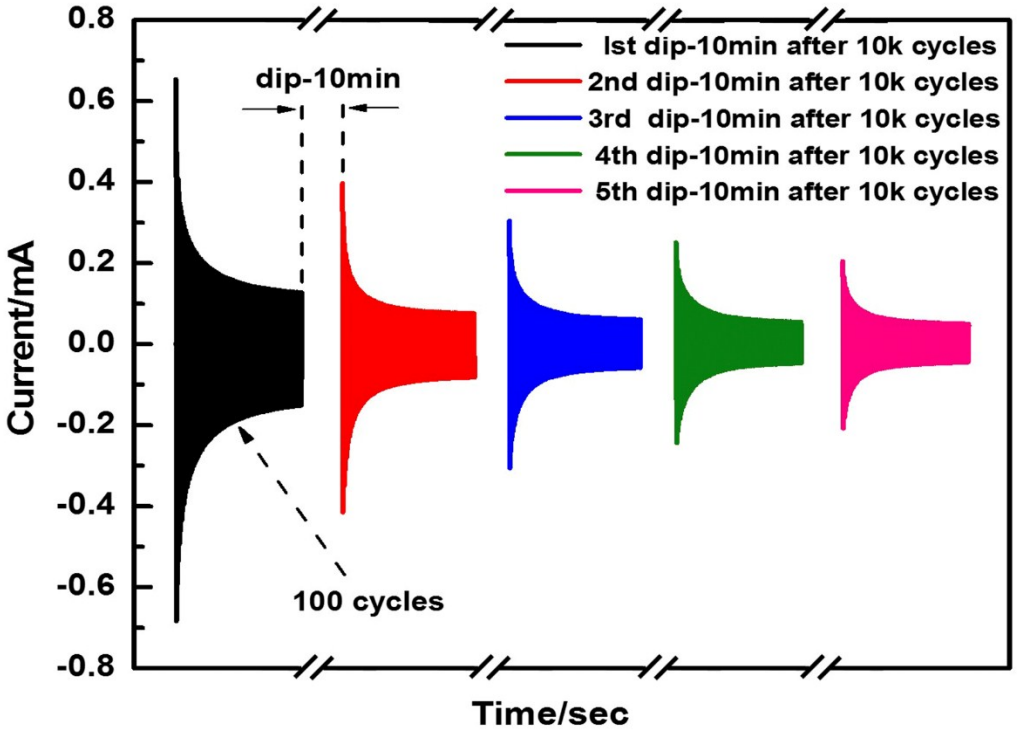

Fig. S5. Stability of the PProDOT-Me_2 film with 10k cycles after 5 times dip in pure PC solution.