

Electronic Supplementary Information for:

## A Non-fullerene Acceptor with All “A” Units Realizing High Open-Circuit Voltage Solution-Processed Organic Photovoltaics

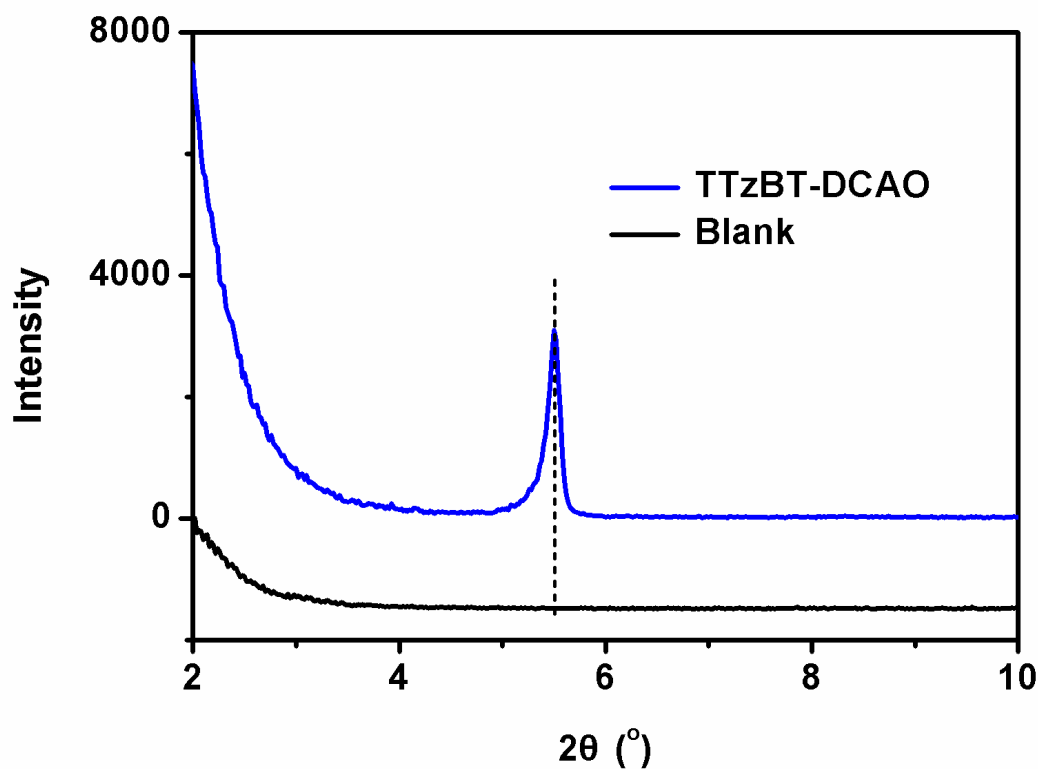
Lingcheng Chen,<sup>a</sup> Linquan Huang,<sup>ac</sup> Dong Yang,<sup>ac</sup> Shuying Ma,<sup>b</sup> Xin Zhou,<sup>a</sup> Jian Zhang,<sup>\*a</sup> Guoli Tu,<sup>\*b</sup> and Can Li<sup>\*a</sup>

<sup>a</sup> State Key Laboratory of Catalysis, Dalian Institute of Chemical Physics, Chinese Academy of Sciences, Dalian National Laboratory for Clean Energy, 457 Zhongshan Road, Dalian 116023, PR China. E-mail: jianzhang@dicp.ac.cn;

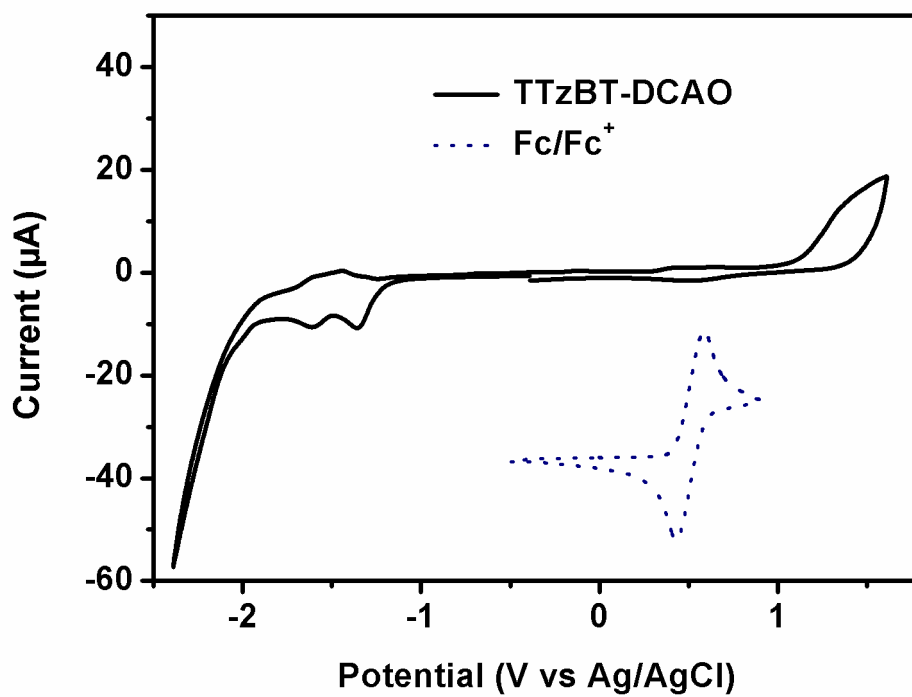
canli@dicp.ac.cn

<sup>b</sup> Wuhan National Laboratory for Optoelectronics, Huazhong University of Science and Technology, Wuhan 430074, PR China. E-mail: tgl@mail.hust.edu.cn

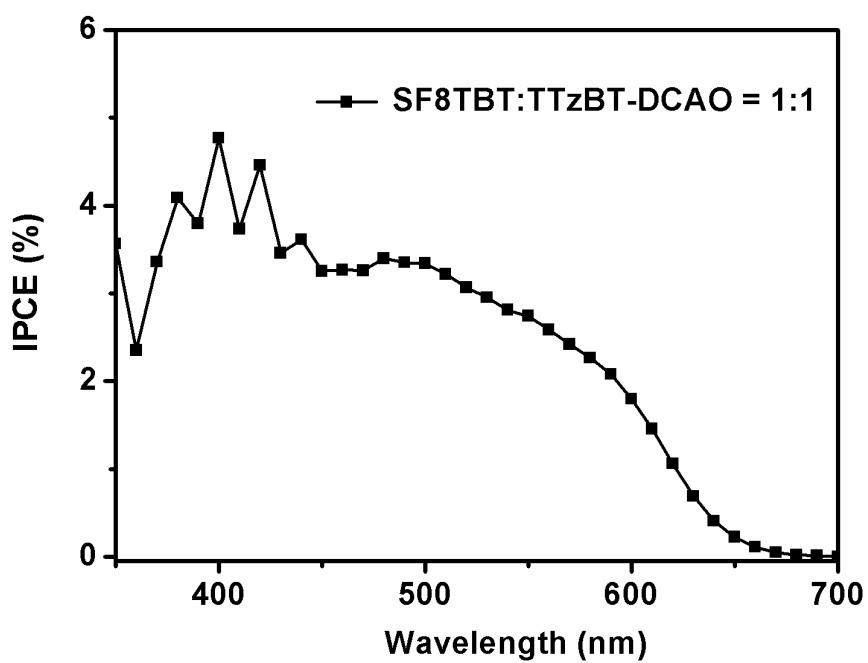
<sup>c</sup> Graduate University of Chinese Academy of Sciences, Beijing 100049, PR China.



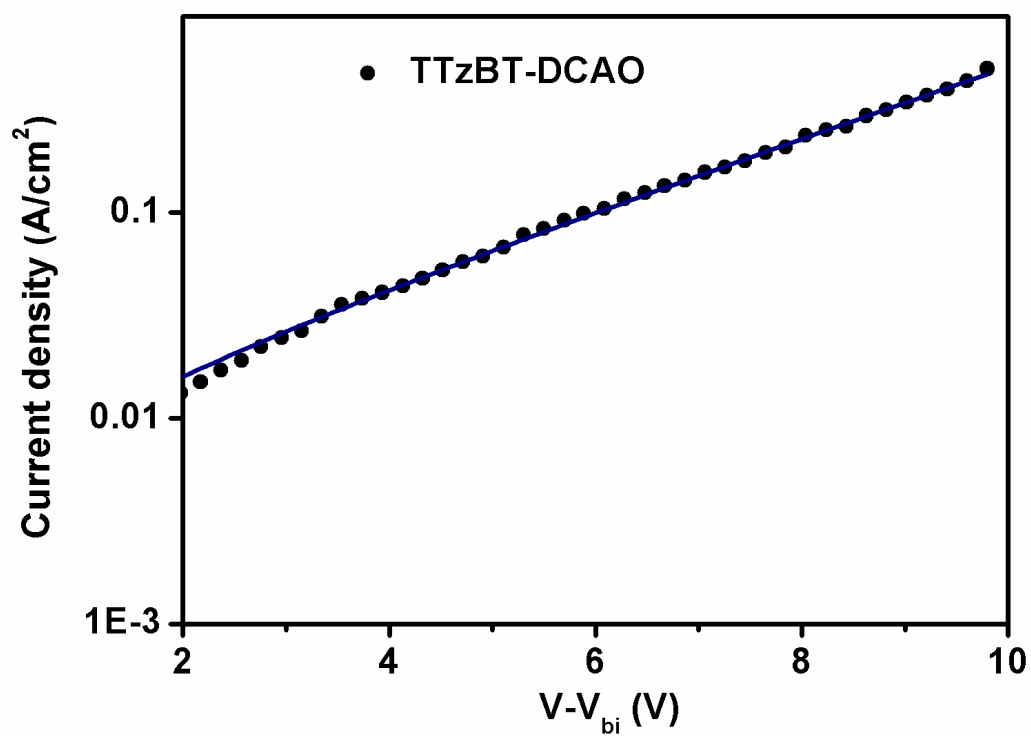
**Fig. S1** XRD patterns of **TTzBT-DCAO** film from chloroform solution used for spin coating on ITO substrate and the ITO (black curve).



**Fig. S2** cyclic voltammograms in DCM solution of 0.1 M Bu<sub>4</sub>NPF<sub>6</sub> with scan rate of 100 mV/s



**Fig. S3** The IPCE spectra of the OPVs based on SF8TBT:TTzBT-DCAO



**Fig. S4** Current density versus voltage characteristics of the electron-only device.