

Electronic Supplementary Information

A New High Conjugated Crossed Benzodithiophene and Its Donor-Acceptor Copolymers for High Open Circuit Voltages Polymer Solar Cells

Deyu Liu ^{‡,a,b}, Chunyang Gu ^{‡,b}, Manjun Xiao ^b, Meng Qiu ^b, Mingliang Sun ^{a*}, Renqiang Yang ^{b*}

^a *Institute of Material Science and Engineering, Ocean University of China, Qingdao 266100, People's Republic of China.*

^b *CAS Key Laboratory of Bio-based Materials, Qingdao Institute of Bioenergy and Bioprocess Technology, Chinese Academy of Sciences, Qingdao 266101, People's Republic of China.*

Correspondence to: M. Sun (E-mail: mlsun@ouc.edu.cn); R. Yang (E-mail: yangrq@qibebt.ac.cn)

[‡] *These authors contributed equally to this work.*

1. X-ray Diffraction

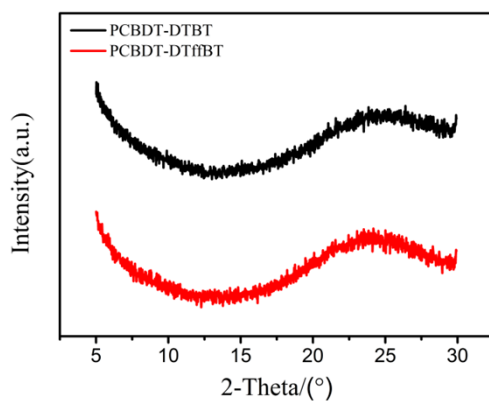


Fig. S1 X-ray diffraction (XRD) pattern of the PCBDT-DTBT and the PCBDT-DTffBT.

2. ^1H NMR and ^{13}C NMR spectra of monomers and polymers

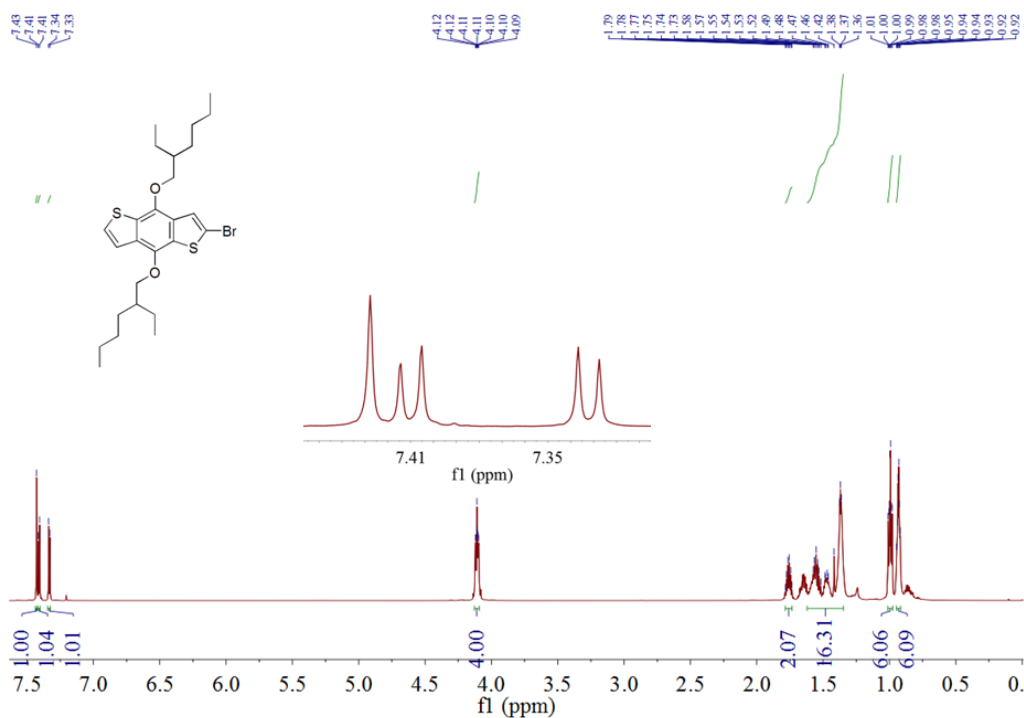


Fig. S2 ^1H NMR spectra of compound 1.

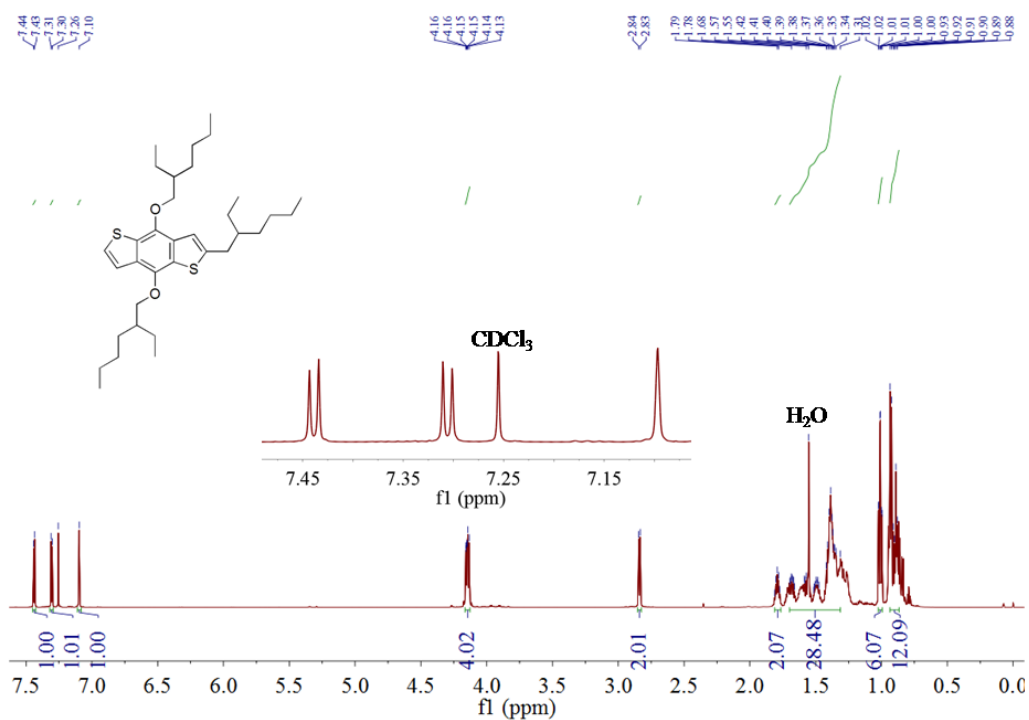


Fig. S3 ^1H NMR spectra of compound 2.

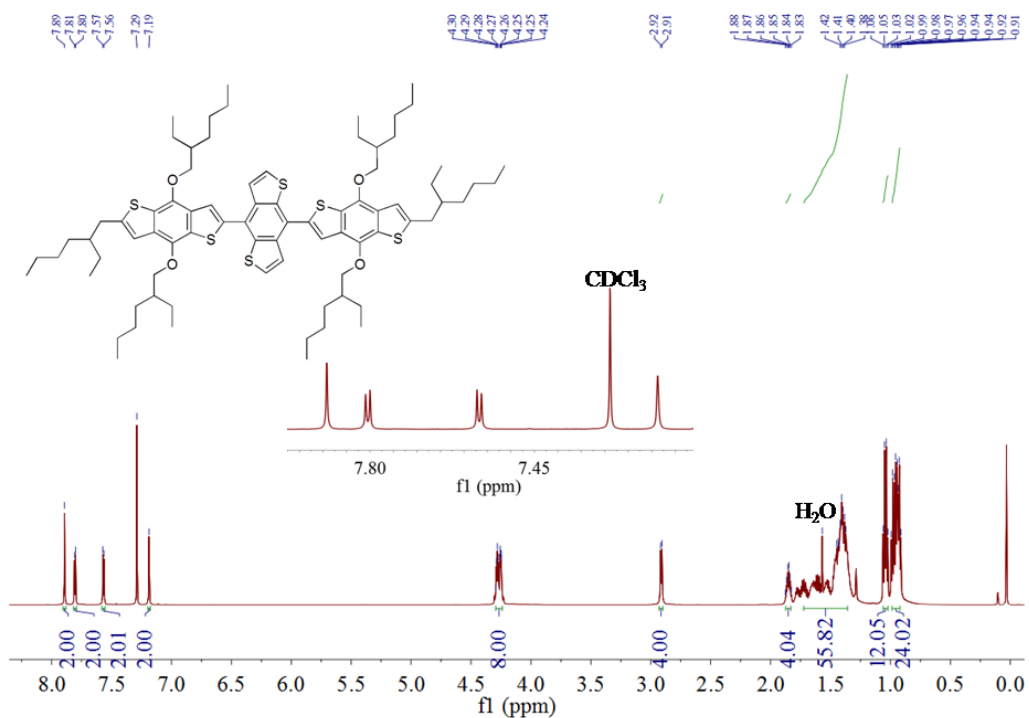
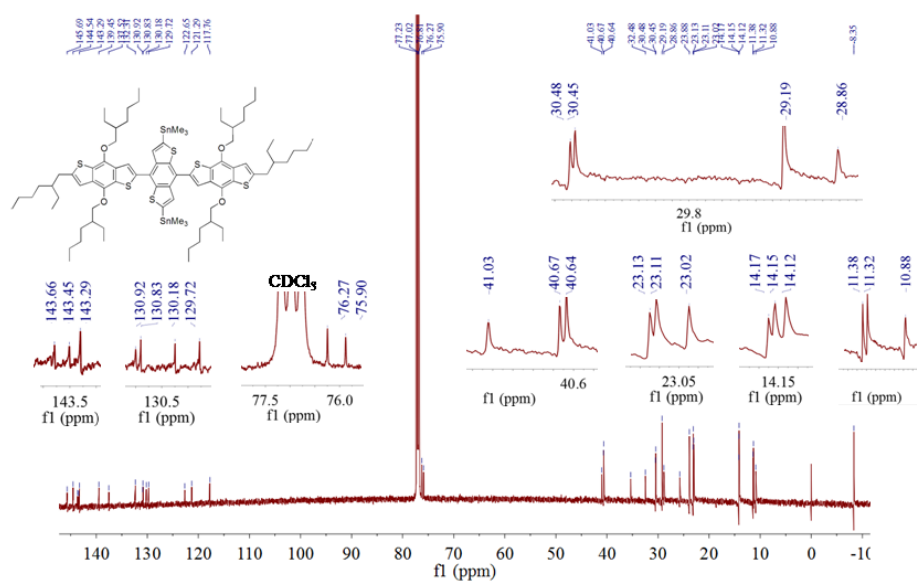
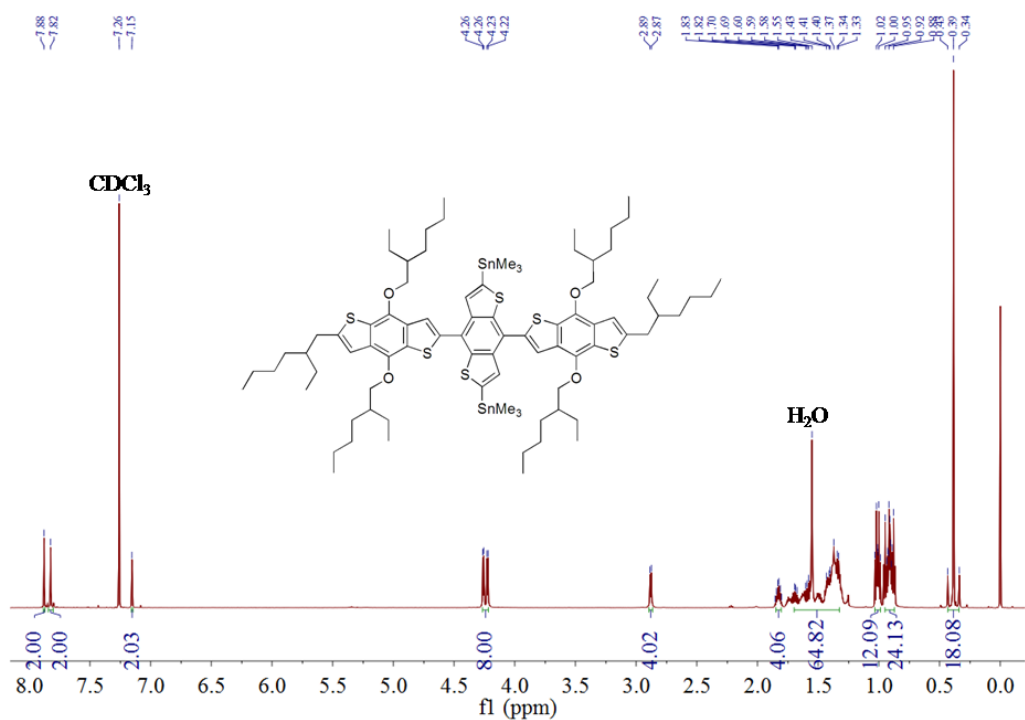


Fig. S4 ^1H NMR spectra of Crossed-BDT.



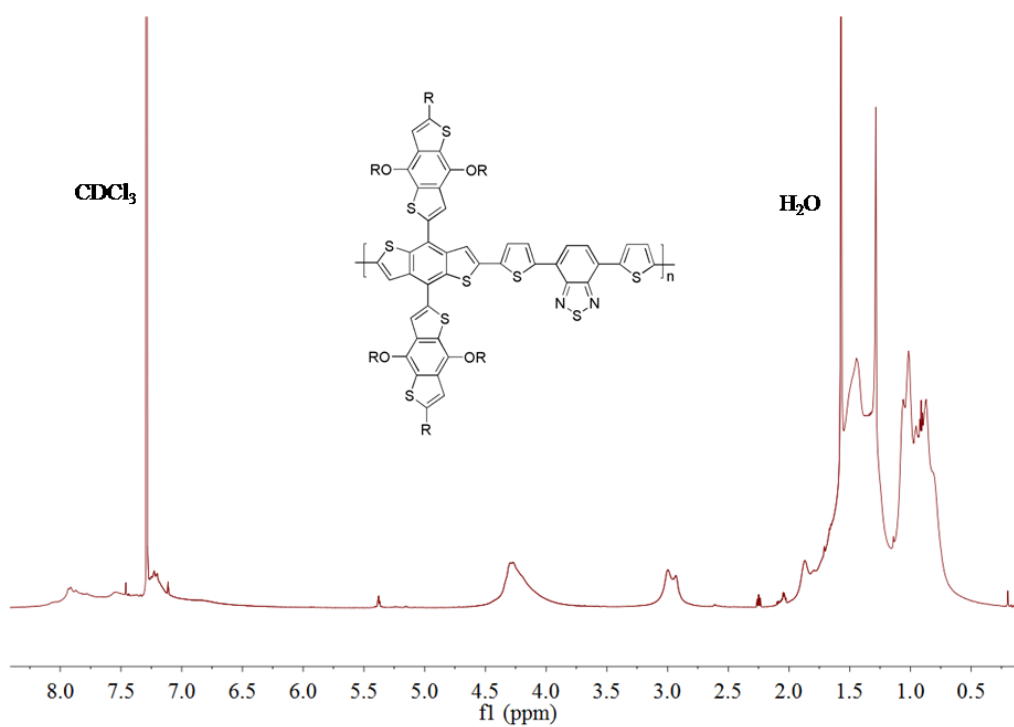


Fig. S7 ¹H NMR spectra of the PCBDT-DTBT.

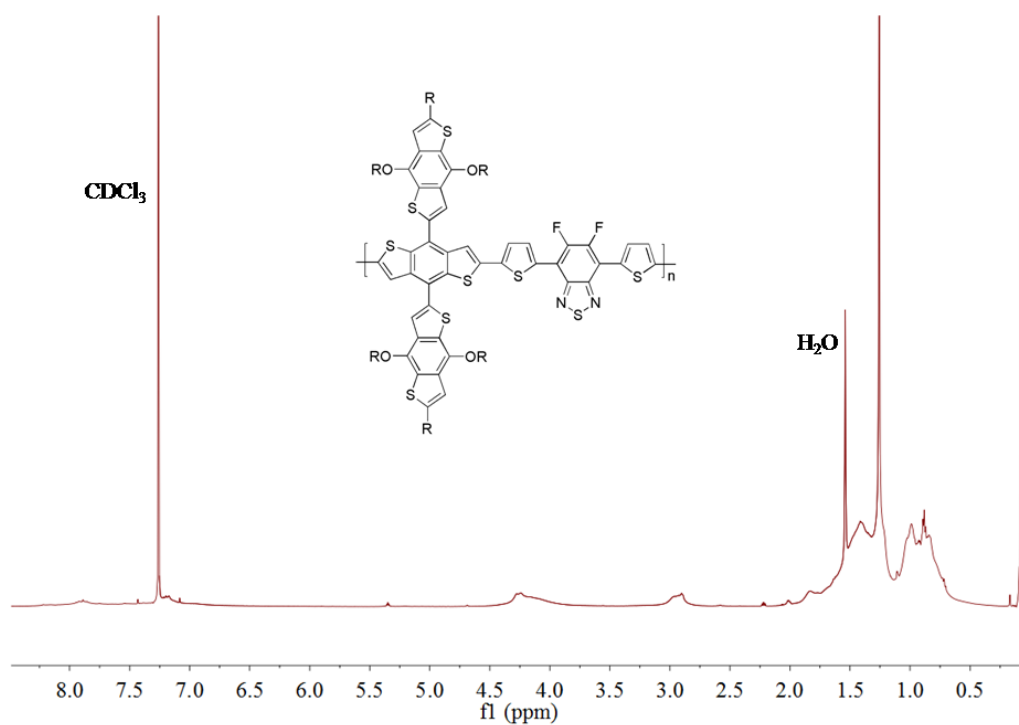


Fig. S8 ¹H NMR spectra of the PCBDT-DTffBT.