Supporting Information

Effects of Alkyl or Alkoxy Side Chains on the Electrochromic Properties of Four Ambipolar Donor-Acceptor Type Polymers

Yanxia Liu, Min Wang, Jinsheng Zhao*, Chuansheng Cui and Jifeng Liu*

Shandong Key laboratory of Chemical Energy Storage and Novel Cell Technology, Liaocheng University, Liaocheng, 252059, P.R. China

Correspondence to: Jinsheng Zhao (E-mail: j.s.zhao@163.com); Jifeng Liu (E-mail:liujifeng1971@163.com)

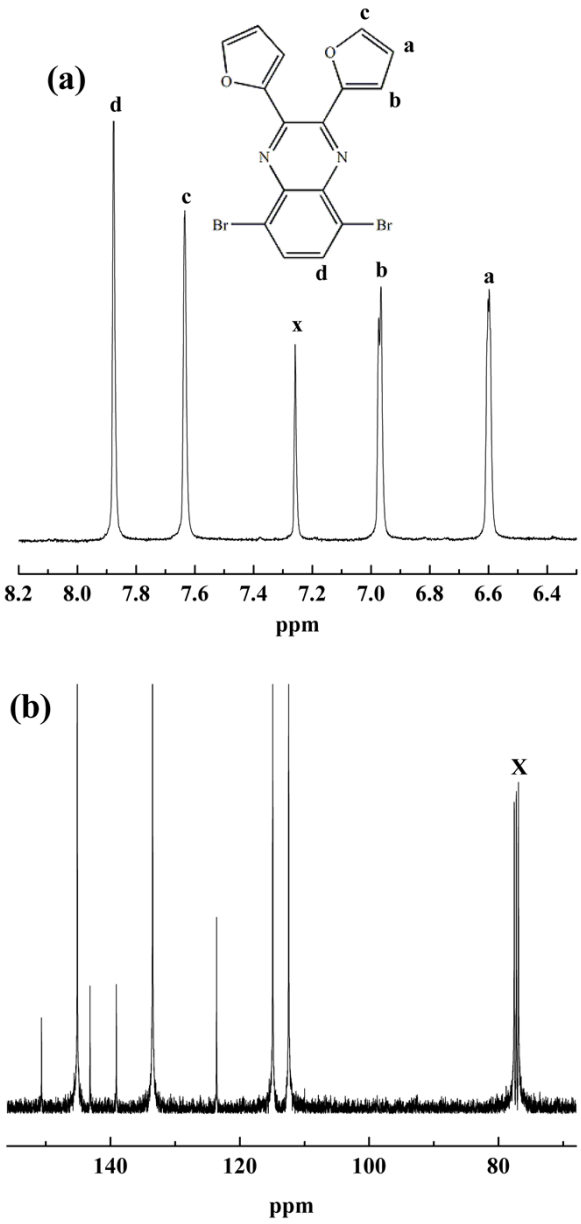

Fig. S1† (a) ^{1}H NMR spectrum of 2,3-bis (2-furyl)-5,8-dibromoquinoxaline in $CDCl_3$. Solvent peak at δ = 7.26 ppm is marked by 'x'. (b) ^{13}C NMR spectrum of 2,3-bis (2-furyl)-5,8-dibromoquinoxaline in $CDCl_3$. Solvent peak at δ = 77.3 ppm is marked by 'x'.

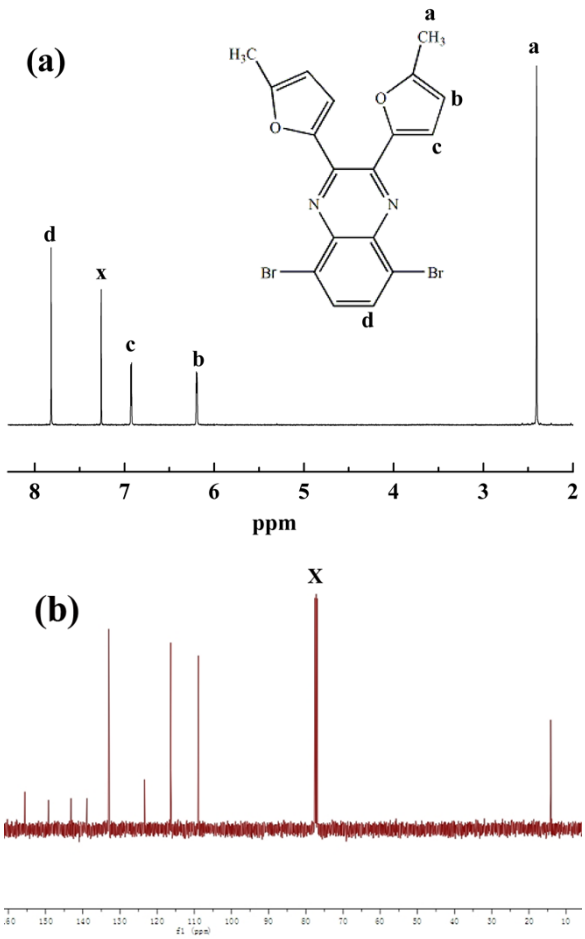

Fig. S2† (a) ^{1}H NMR spectrum of 2,3-bis(5-methylfuran-2-yl)-5,8-dibromoquinoxaline in $CDCl_3$. Solvent peak at δ = 7.26 ppm is marked by 'x'. (b) ^{13}C NMR spectrum of 2,3-bis(5-methylfuran-2-yl)-5,8-dibromoquinoxaline in $CDCl_3$. Solvent peak at δ = 77.3 ppm is marked by 'x'.

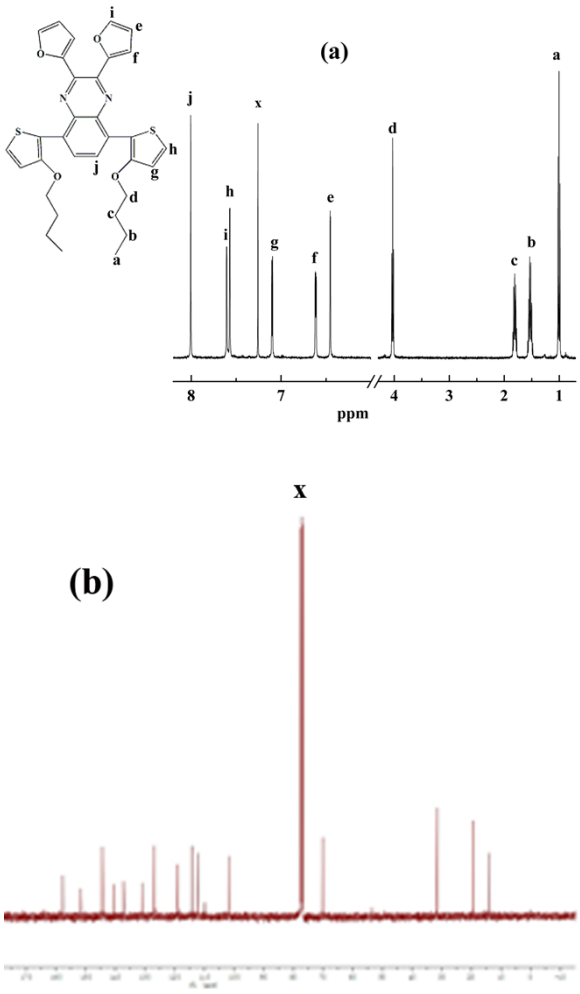

Fig. S3† (a) ^{1}H NMR spectrum of 2,3-di(2-furyl)-5,8-bis(2-(3-butoxythiophene)) quinoxaline (FBOTQ) monomer in $CDCl_3$. Solvent peak at δ = 7.26 ppm is marked by 'x'. (b) ^{13}C NMR spectrum of 2,3-di(2-furyl)-5,8-bis(2-(3-butoxythiophene)) quinoxaline (FBOTQ) monomer in $CDCl_3$. Solvent peak at δ = 77.3 ppm is marked by 'x'.

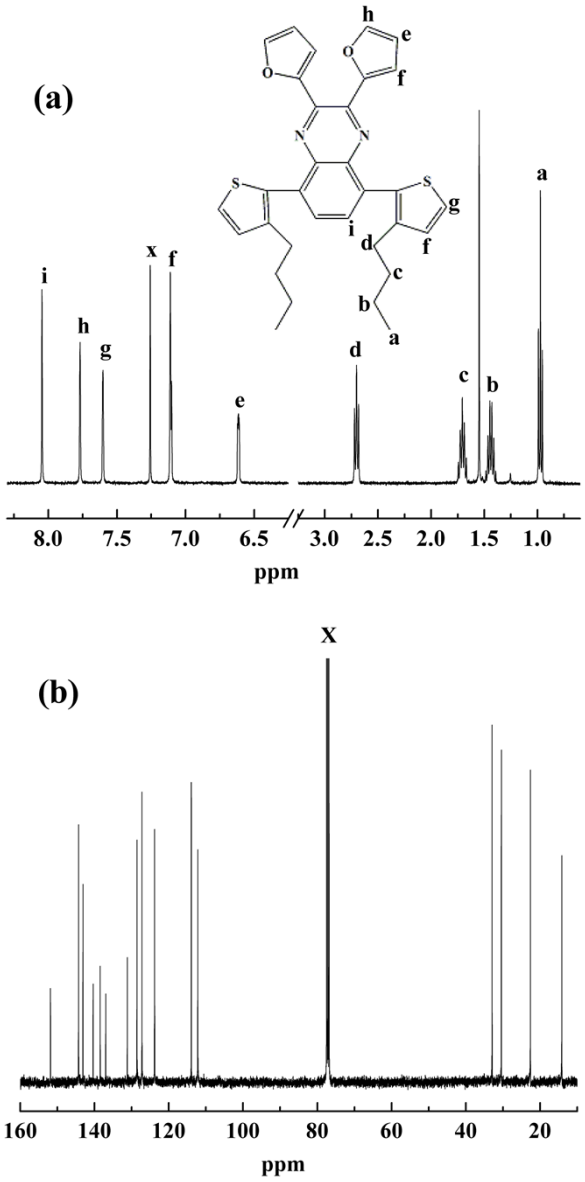

Fig. S4† (a) ^{1}H NMR spectrum of 2,3-di(2-furyl)-5,8-bis(2-(3-butylthiophene)) quinoxaline (FBTQ) monomer in $CDCl_3$. Solvent peak at δ = 7.26 ppm is marked by 'x'. (b) ^{13}C NMR spectrum of 2,3-di(2-furyl)-5,8-bis(2-(3-butylthiophene)) quinoxaline (FBTQ) monomer in $CDCl_3$. Solvent peak at δ = 77.3 ppm is marked by 'x'.

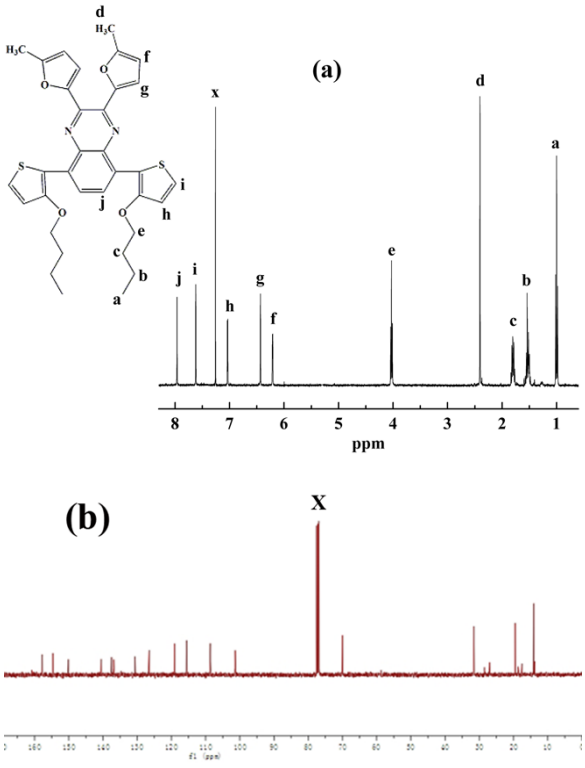

Fig. S5† (a) ^{1}H NMR spectrum of 2,3-di(5-methylfuran-2-yl)-5,8-bis(2-(3-butoxythiophene)) quinoxaline (MFBOTQ) monomer in $CDCl_3$. Solvent peak at δ = 7.26 ppm is marked by 'x'. (b) ^{13}C NMR spectrum of 2,3-di(5-methylfuran-2-yl)-5,8-bis(2-(3-butoxythiophene)) quinoxaline (MFBOTQ) monomer in $CDCl_3$. Solvent peak at δ = 77.3 ppm ppm is marked by 'x'.

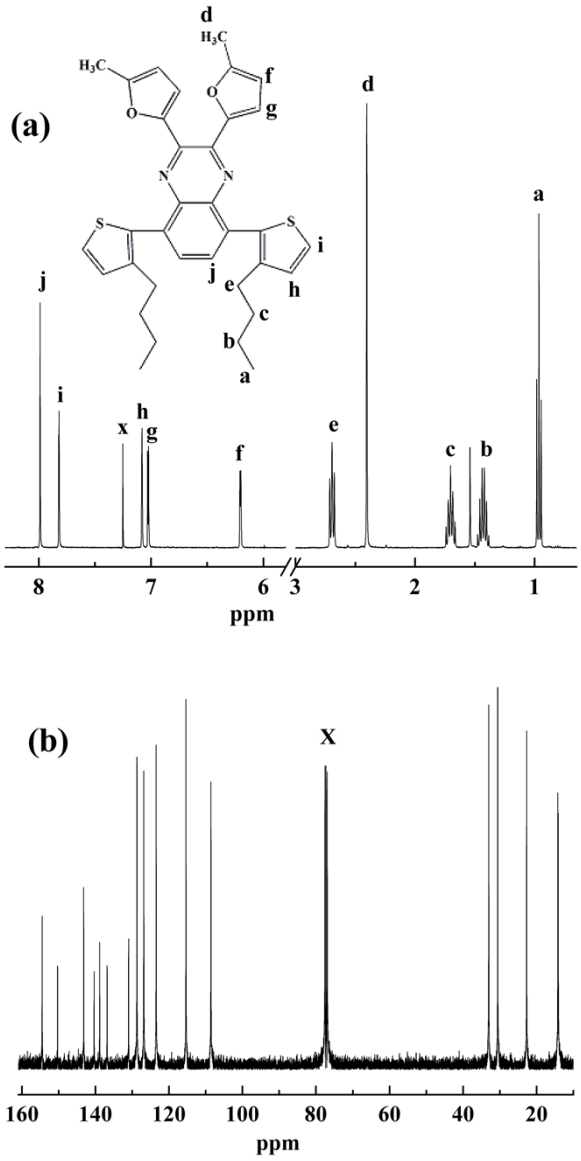

Fig. S6† (a) ^{1}H NMR spectrum of 2,3-di(5-methylfuran-2-yl)-5,8-bis(2-(3-butylthiophene)) quinoxaline (MFBTQ) monomer in $CDCl_3$. Solvent peak at δ = 7.26 ppm is marked by 'x'. (b) ^{13}C NMR spectrum of 2,3-di(5-methylfuran-2-yl)-5,8-bis(2-(3-butylthiophene)) quinoxaline (MFBTQ) monomer in $CDCl_3$. Solvent peak at δ = 77.3 ppm is marked by 'x'.

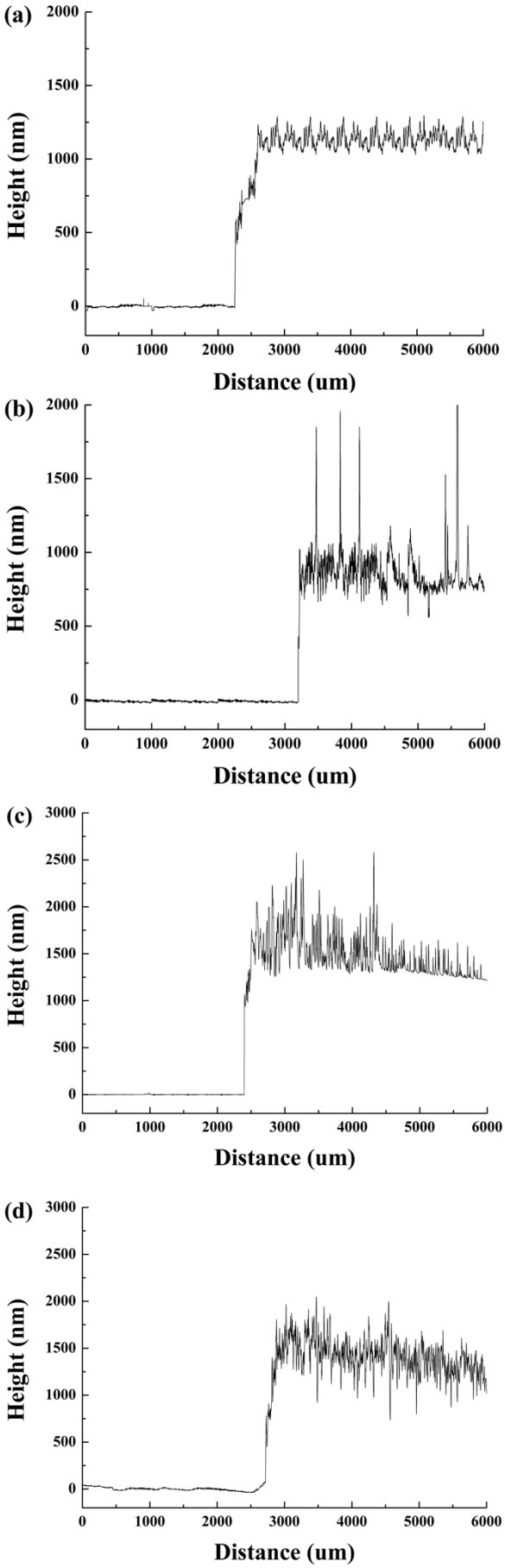
(a)
Height (nm)
2000
1500
1000
500
0
0
1000
2000
3000
4000
5000
6000
Distance (um)
(b)
Height (nm)
2000
1500
1000
500
0
0
1000
2000
3000
4000
5000
6000
Distance (um)
(c)
Height (nm)
3000
2500
2000
1500
1000
500
0
0
1000
2000
3000
4000
5000
6000
Distance (um)
(d)
Height (nm)
3000
2500
2000
1500
1000
500
0
0
1000
2000
3000
4000
5000
6000
Distance (um)

Fig. S7† Thicknesses of the PFBOTQ (a), PMFBOTQ (b), PFBTQ (c) and PMFBTQ (d) films deposited potentiostatically onto ITO electrode.