Supplementary Data

FT-IR

Table S1. Main vibration modes in the **PFDPP** family of polymers

Vibration mode	PFDPP-1	PFDPP-2	PFDPP-3
	Wave number (cm^{-1})		
=C-H st	3066	3066	3066
CH_3 ν_{as}	2959	2959	2956
CH_2 ν_{as}	2925	2925	2919
CH_2 ν_s	2852	2852	2852
C=O st	1664	1658	1658
C-N st	1537	1544	1551
C=C st	1510	1510	1510
δ(C-H) in the thiophene plane	1068	1061	1061
S, thiophene	793	793	786
C-H out of plane of the thiophene ring ν	731	731	732
Deformation C-H out of plane of the thiophene ring	625	632	632

^{1}H NMR

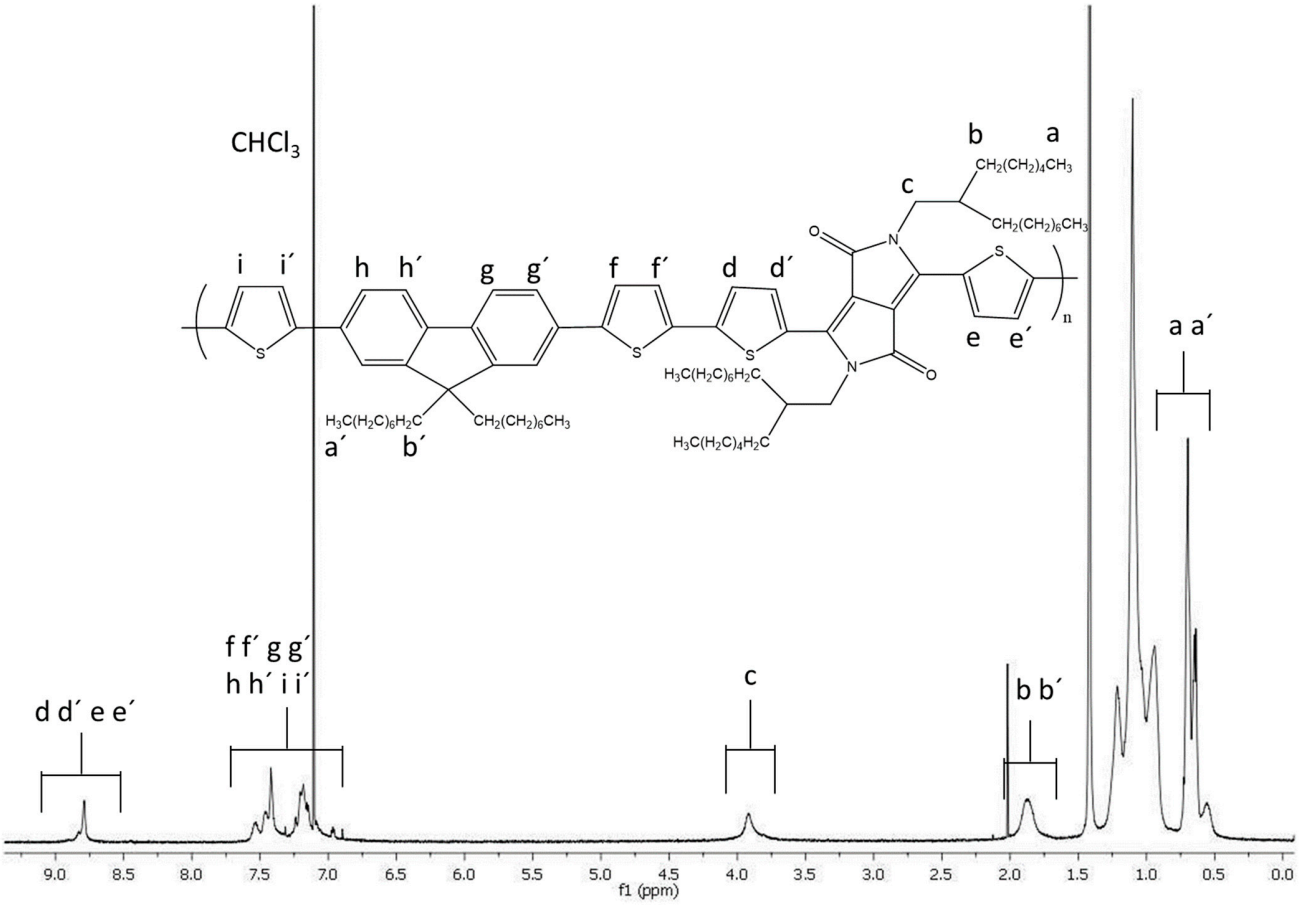

Figure S1. ^{1}H NMR spectra of **PFDPP-2** in $CDCl_3$

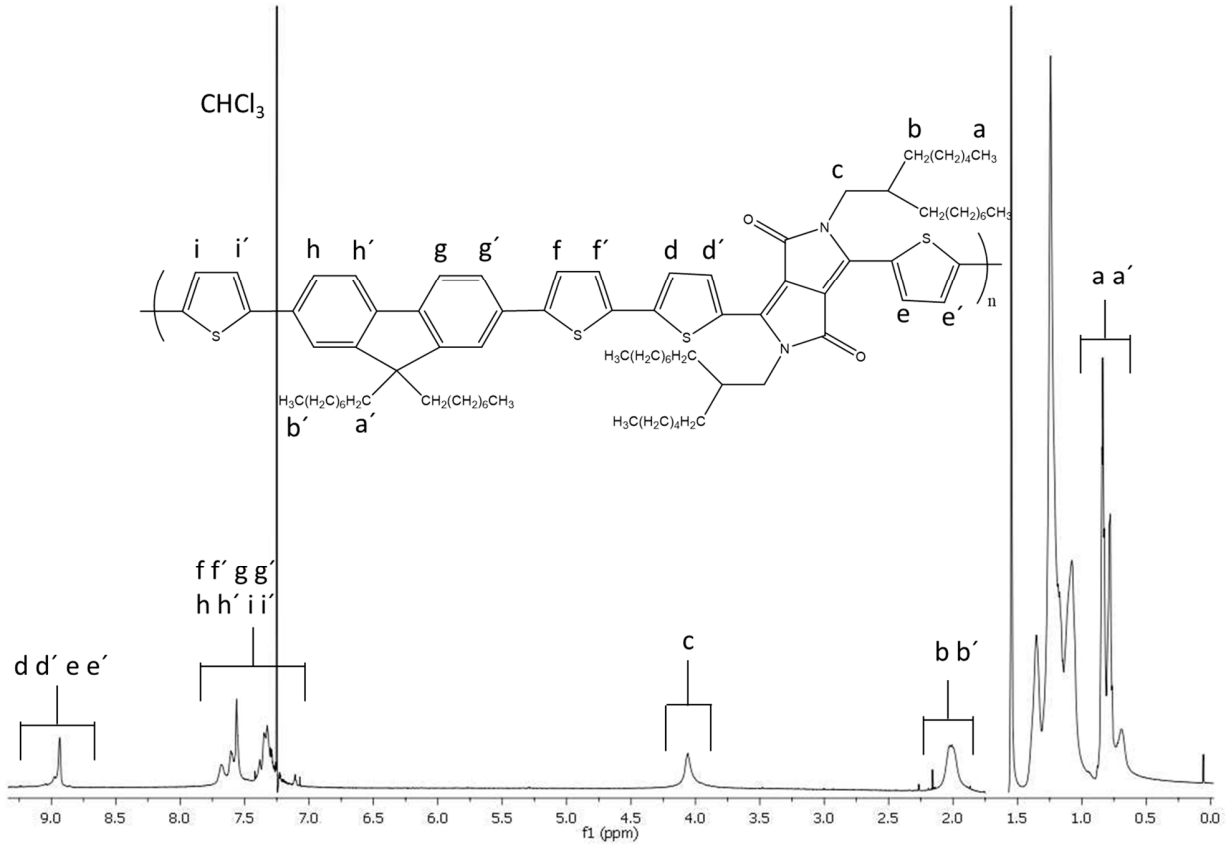

Figure S2. ^{1}H NMR spectra of **PFDPP-3** in $CDCl_3$

GPC

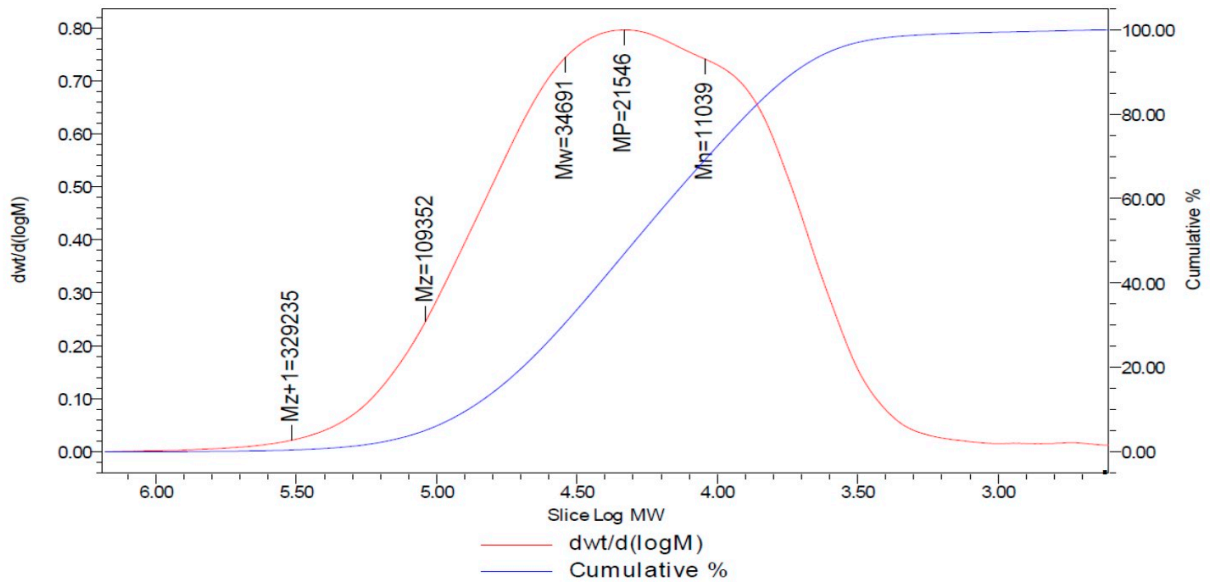

Figure S3. Molecular weight distribution of **PFDPP-1**

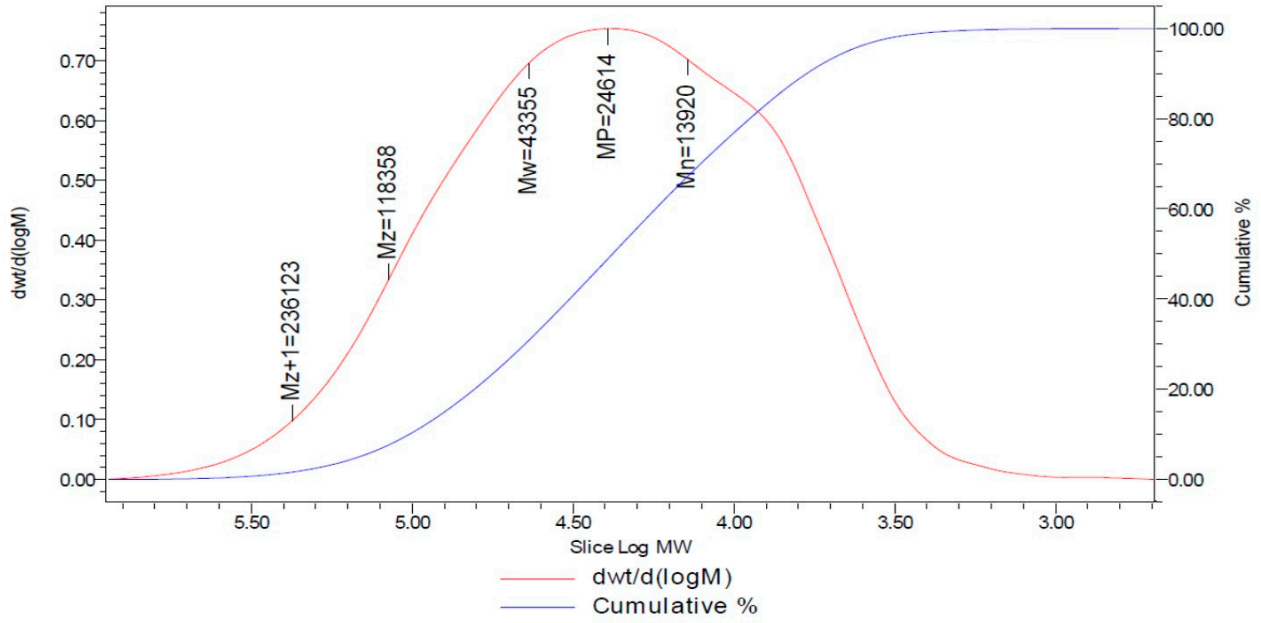

Figure S4. Molecular weight distribution of **PFDPP-2**

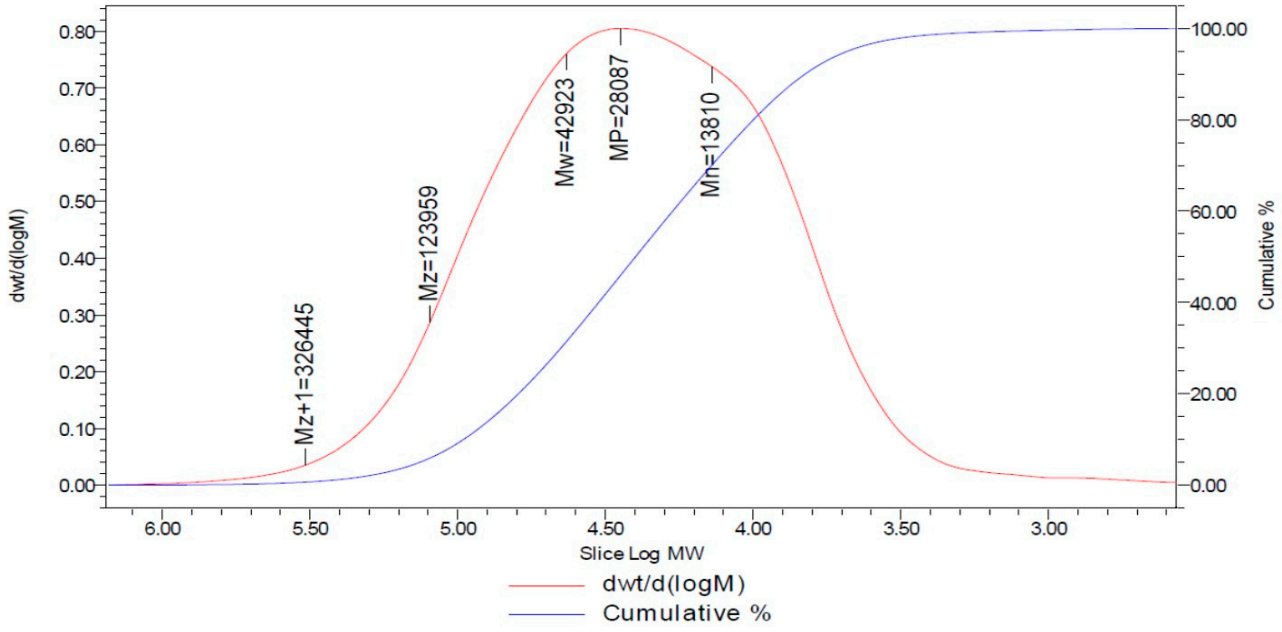

Figure S5. Molecular weight distribution of **PFDPP-3**

Table S2. Fitting of lifetime fluorescence of the **PFDPP** polymers

Polymer	τ_1 (ns)	B_1	τ_2 (ns)	B_2
PFDPP-1	0.78	0.013	-	-
PFDPP-2	0.77	0.029	-	-
PFDPP-3	0.70	0.013	1.16	0.023

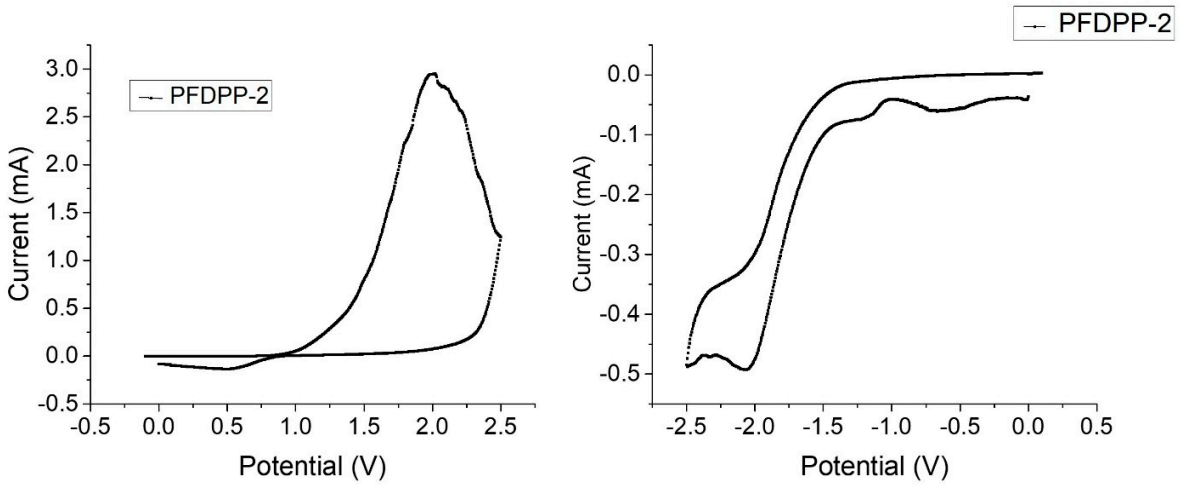

Figure S6. Cyclic voltammograms of **PFDPP-2** film polymer (oxidation left and reduction right).

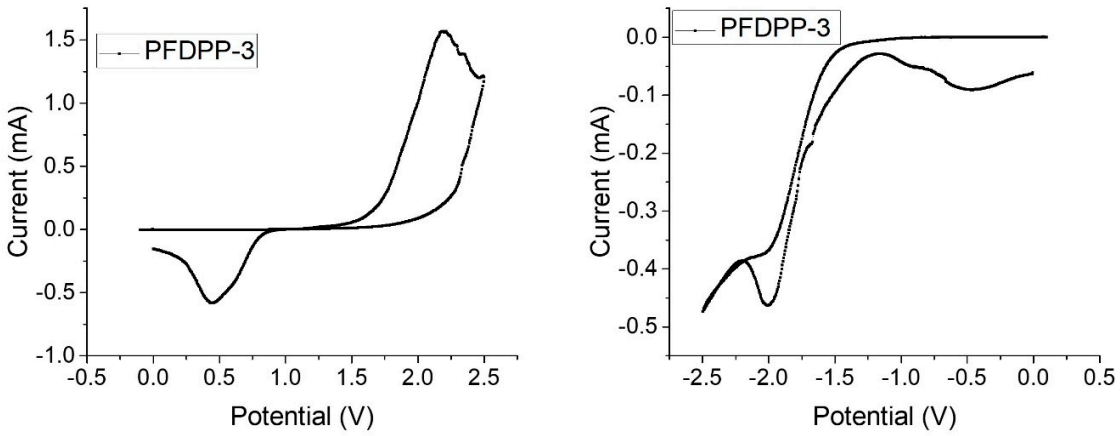

Figure S7. Cyclic voltammograms of **PFDPP-3** film polymer (oxidation left and reduction right).