Supporting Information for:

New n-Type Polymer Semiconductors Based on Naphthalene Diimide and Selenophene Derivatives for Organic Field-Effect Transistors

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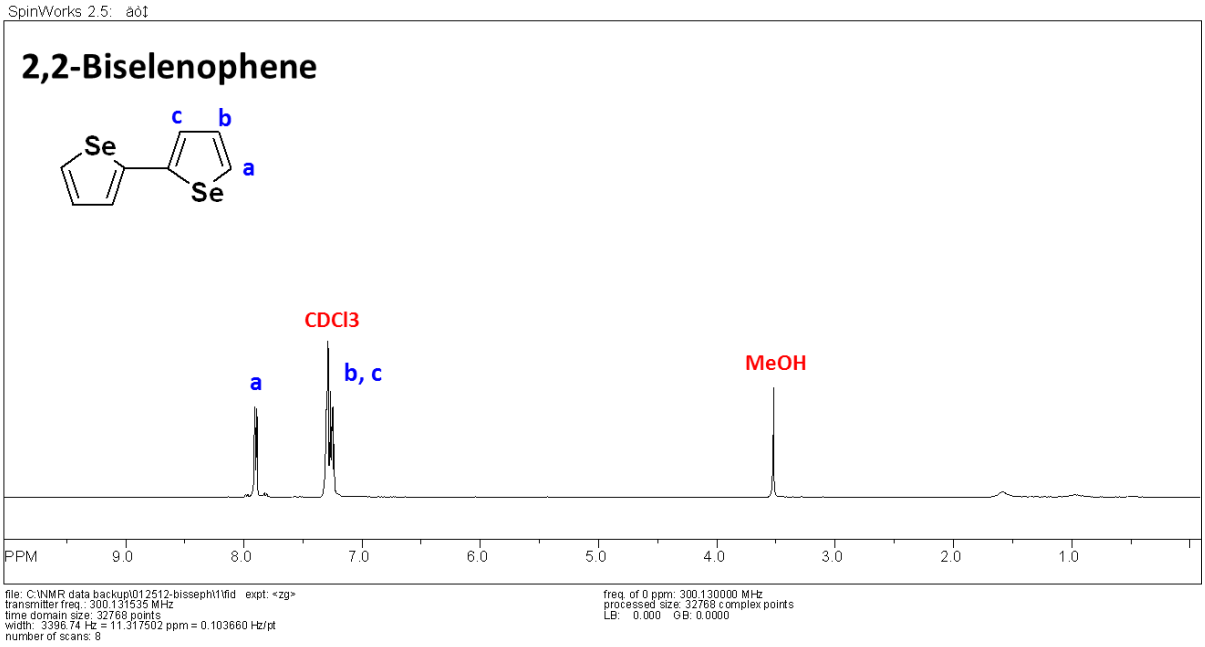


Fig. S1 ^{1}H NMR spectra of 2,2-biselenophene.

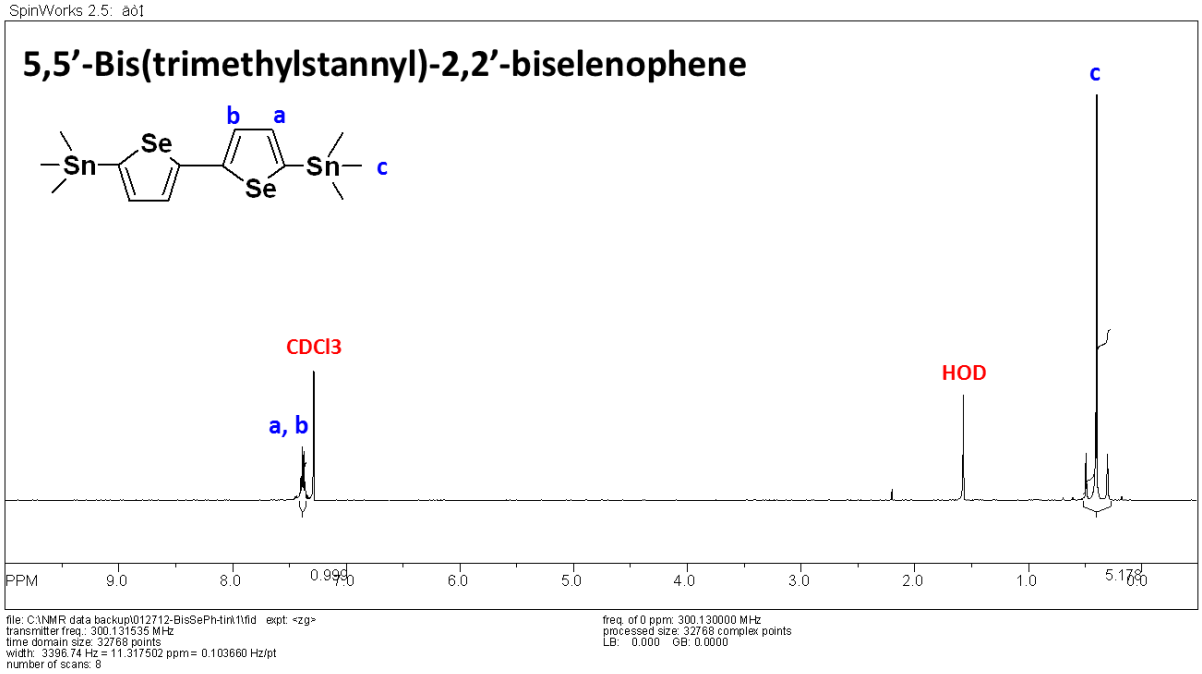


Fig. S2 ^{1}H NMR spectra of 5,5'-bis(trimethylstannyl)-2,2-biselenophene.

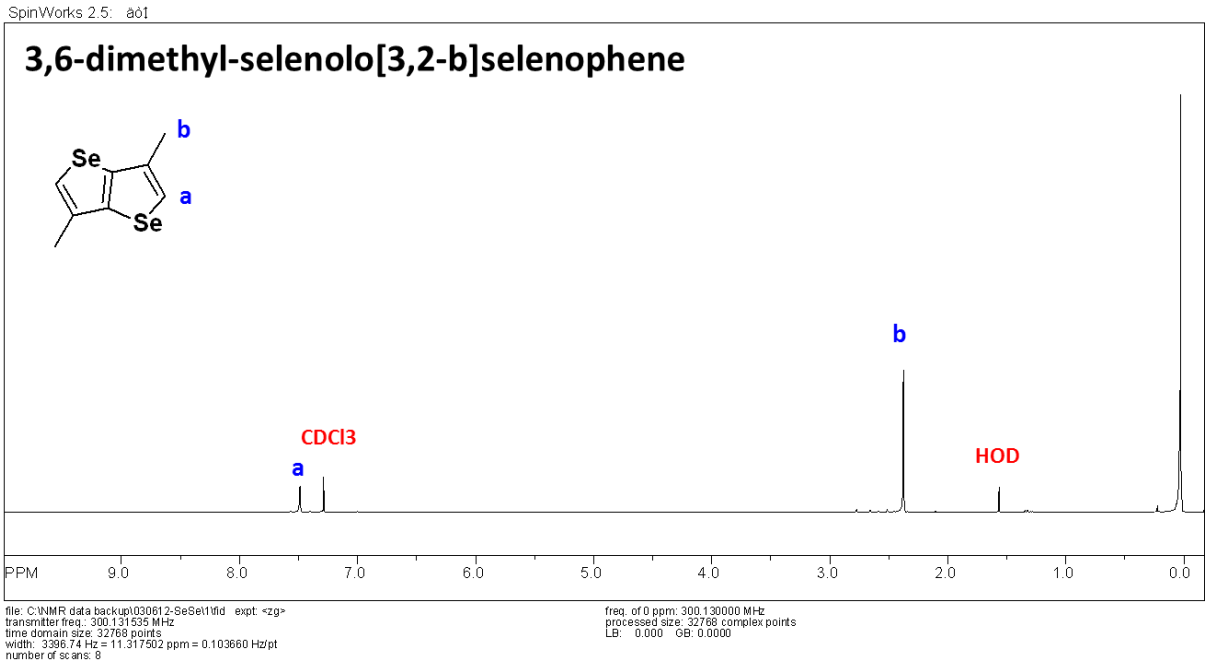


Fig. S3 ^{1}H NMR spectra of 3,6-dimethyl-selenolo[3,2-b]selenophene.

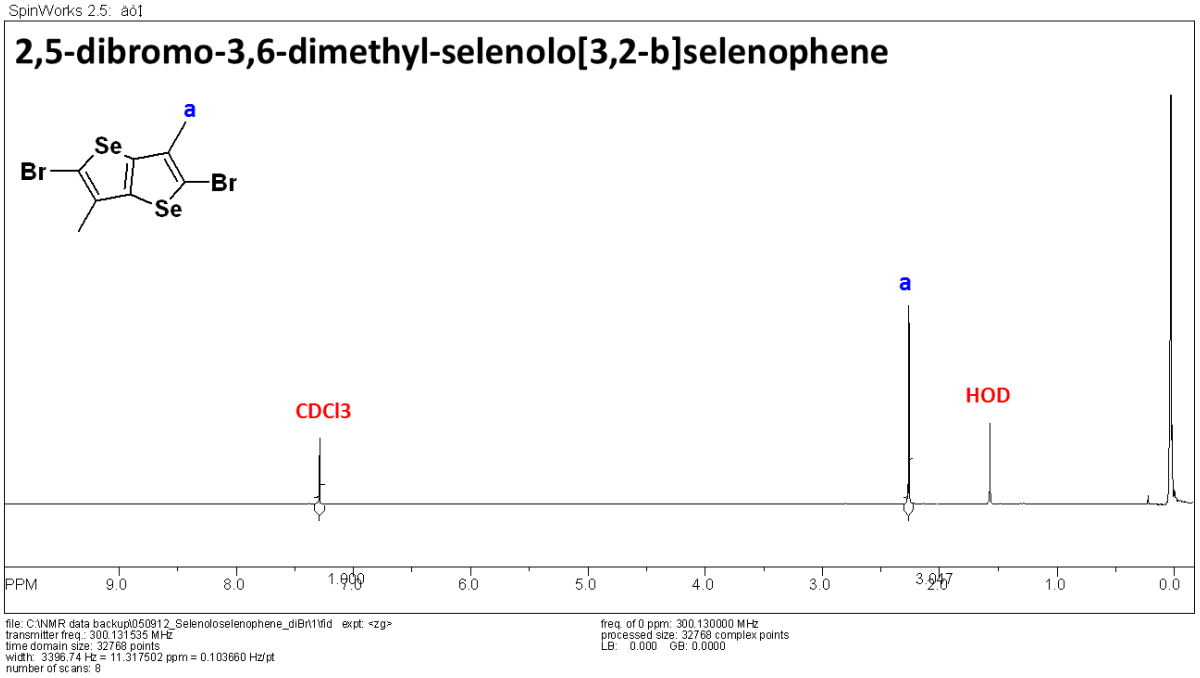


Fig. S4 ^{1}H NMR spectra of 2,5-dibromo-3,6-dimethyl-selenolo[3,2-b]selenophene.

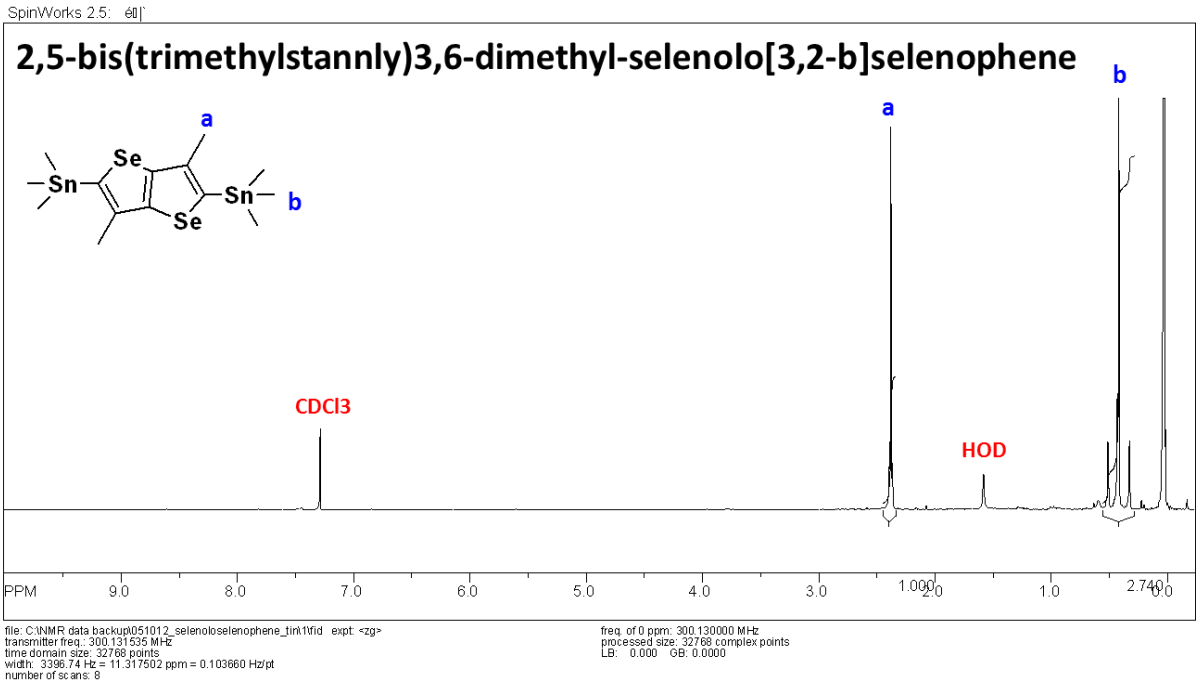


Fig. S5 ^{1}H NMR spectra of 2,5-bis(trimethylstannyl)-3,6-dimethyl-selenolo[3,2-b]selenophene.

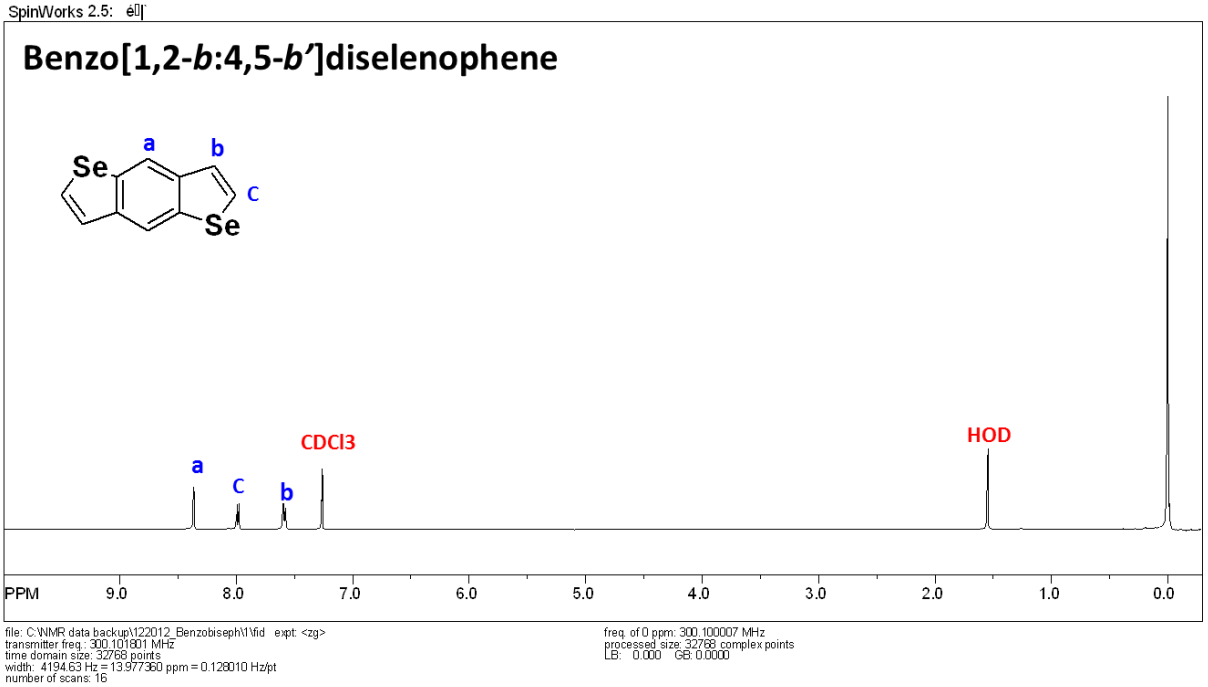


Fig. S6 ^{1}H NMR spectra of benzo[1,2-*b*:4,5-*b*']diselenophene.

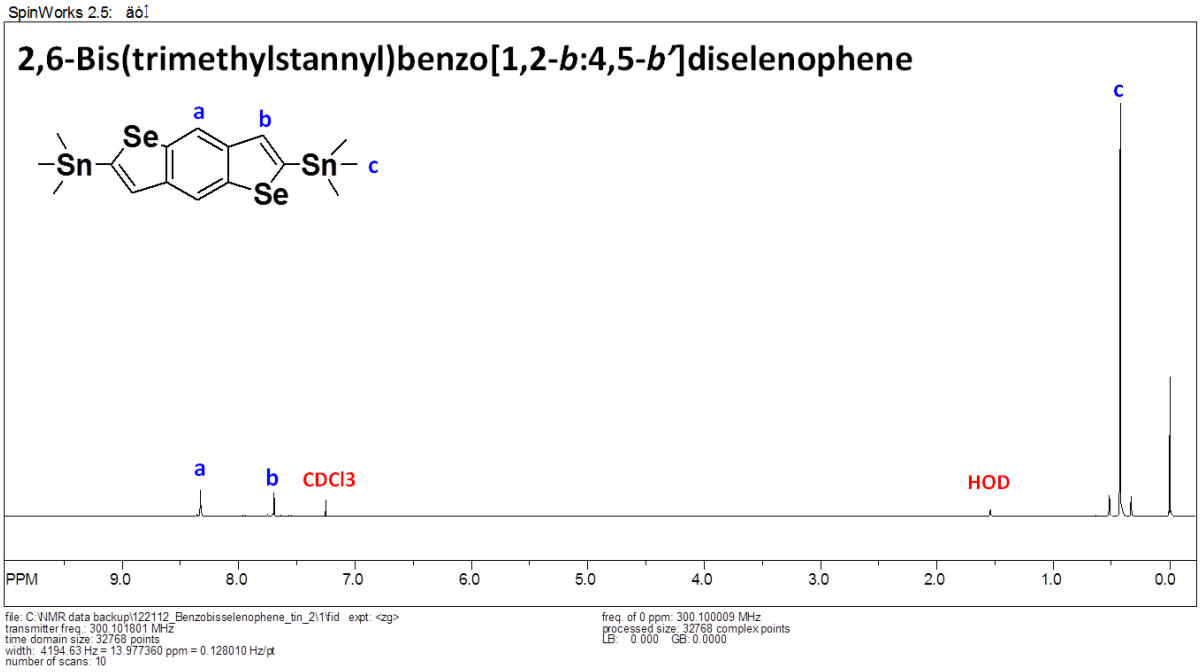
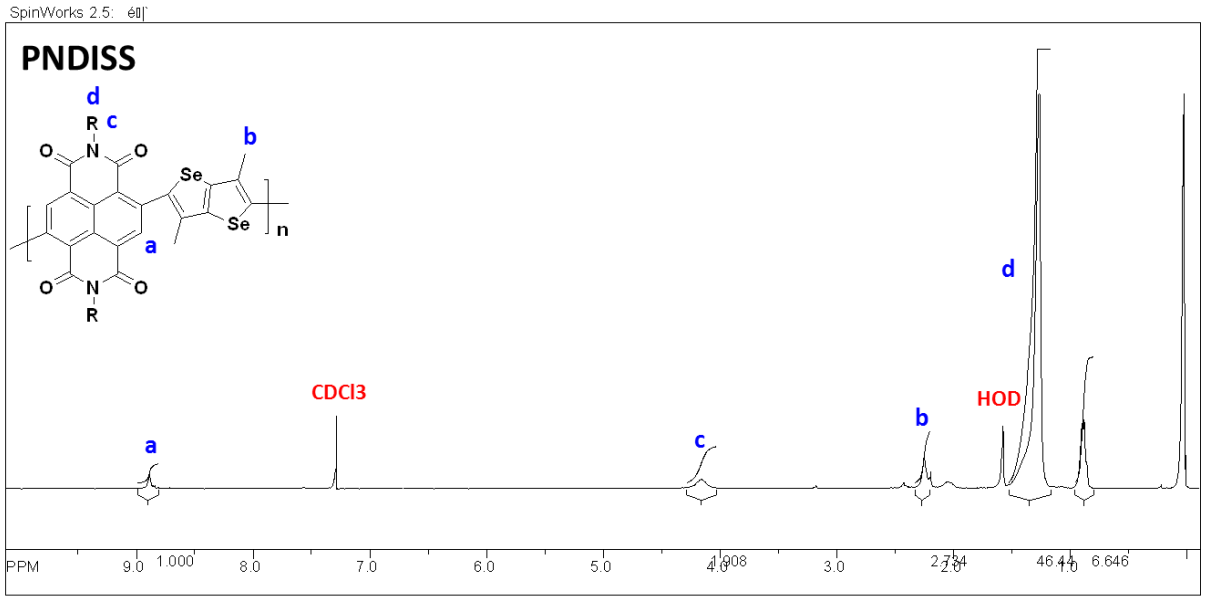


Fig. S7 ^{1}H NMR spectra of 2,6-bis(trimethylstannyl)benzo[1,2-*b*:4,5-*b*']diselenophene.



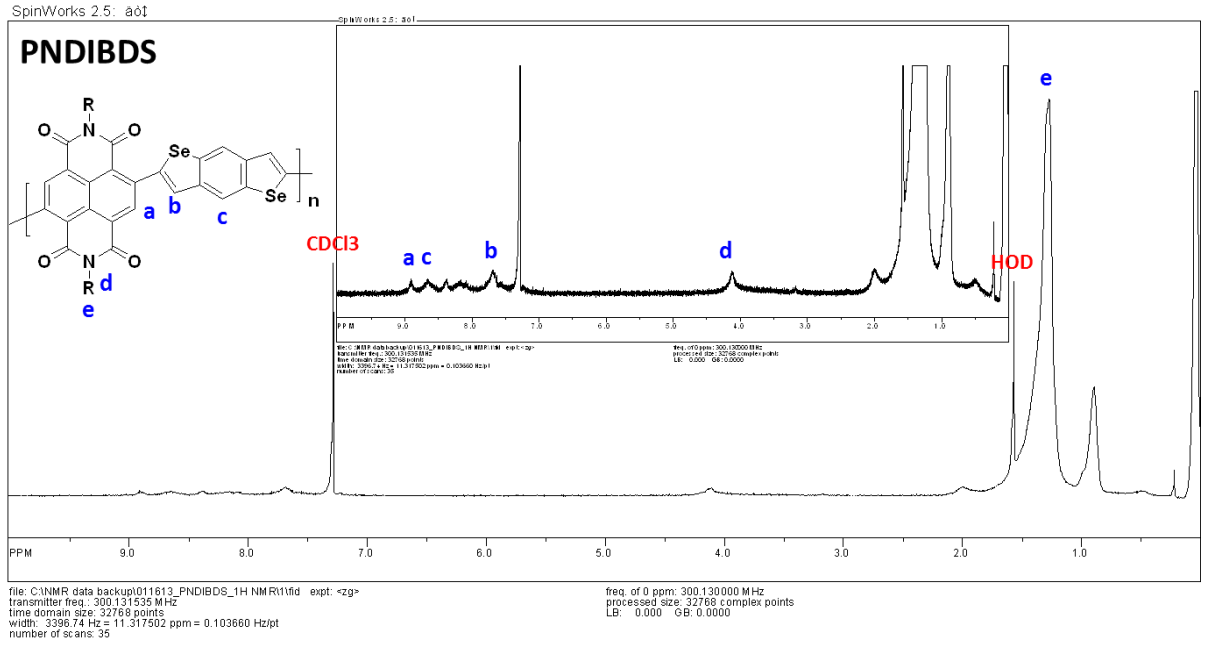


Fig. S8 ^{1}H NMR spectra of poly(naphthalene diimides) PNDISS and PNDIBDS.

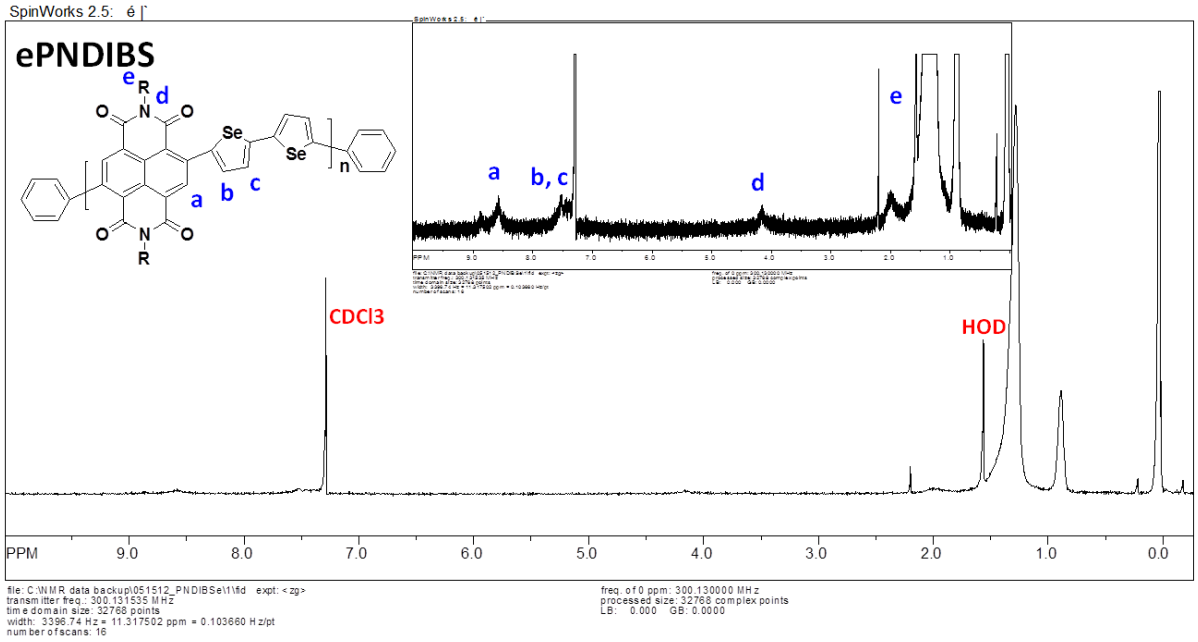


Fig. S9 ^{1}H NMR spectra of poly(naphthalene diimides) ePNDIBS.

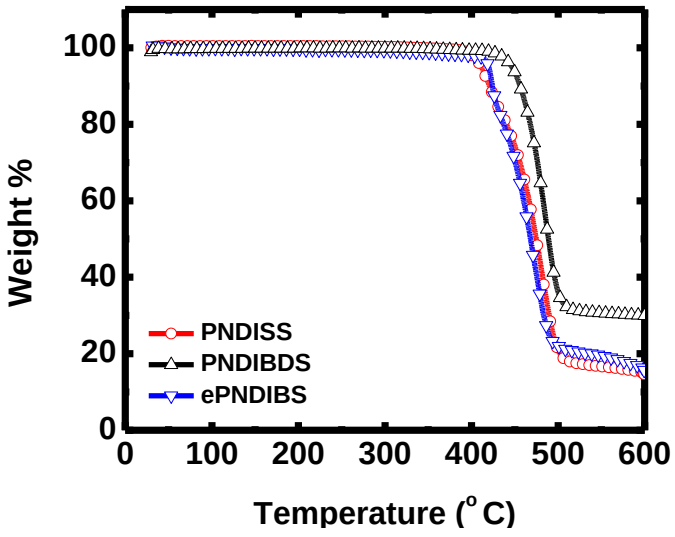


Fig. S10 TGA thermograms of PNDIs in N_2.

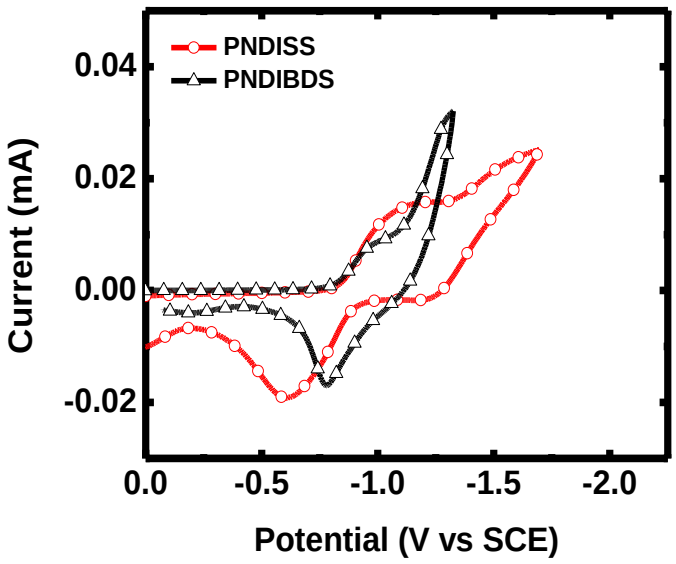


Fig. S11 Cyclic voltammograms of PNDIS, PNDISS and PNDIBDS thin films in 0.1 M Bu_4NPF_6 solution in acetonitrile at a scan rate of 50 mV s^{-1}.

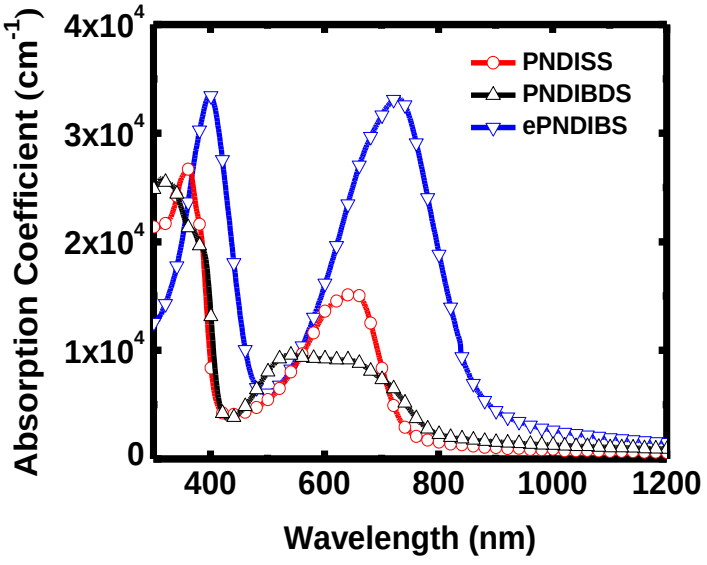


Fig. S12 Absorption spectra of PNDIs.

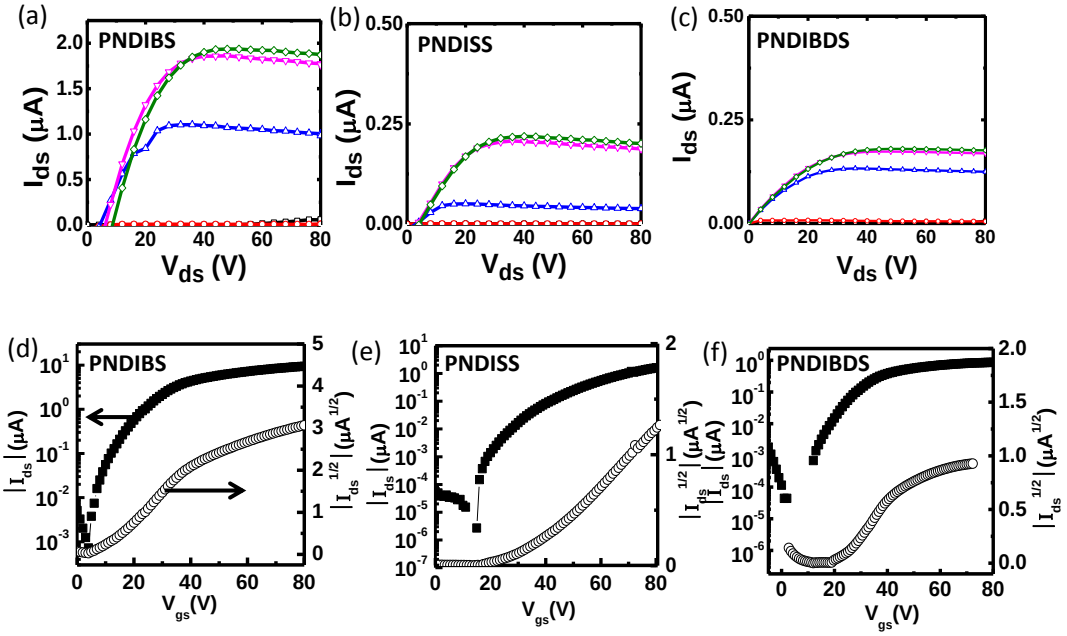


Fig. S13 Output and transfer characteristics of the OFETs based on PNDIs and PNDIBS[27].

Table S1. Molecular Weight and Thermal Stability of End-capped PNDIs.

copolymer	M_w[a] (kDa)	M_n[a] (kDa)	M_w / M_n[a]	T_d[b] (°C)
ePNDISS	11.3	9.0	1.3	400
ePNDIBDS	29.1	14.7	2.0	430

[a] Molecular weights were determined by GPC using polystyrene standards. [b] Onset decomposition temperature measured from TGA under nitrogen.

Table S2. Electrochemical and Optical Properties of End-capped PNDIs.

copolymer	EA[a] (eV)	IP[b] (eV)	E_g^{el} (eV)	λ_{max}[c] (nm)	λ_{max}[d] (nm)	E_g^{opt} (eV)
ePNDISS	3.86	-	-	357, 594	357, 653	1.70
ePNDIBDS	3.90	-	-	305, 561	342, 538	1.53

[a] Electron affinity was obtained based on EA = eE_{redox}^{onset} (vs SCE) + 4.64 eV. [b] Ionization potential was obtained based on IP = eE_{ox}^{onset} (vs SCE) + 4.64 eV. [c] The absorption maximum in dilute solution. [d] The thin film absorption maximum.