Electronic Supplementary Material (ESI) for Journal of Materials Chemistry C

Supporting Information

Ambipolar charge-transport property for the D-A complex with naphthalene diimide motif

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1. TGA analysis of $4NH_2$-NDI

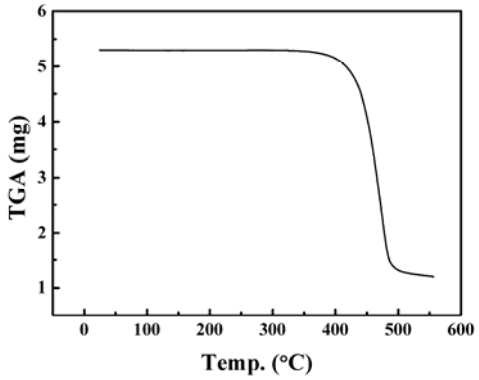

Fig. S1 TGA curves of **$4NH_2$-NDI** from 25 °C to 550 °C with heating rate of 10 °C/min. under nitrogen atmosphere.

2. Absorption spectra of blend thin films of DHNDI and $4NH_2$-NDI

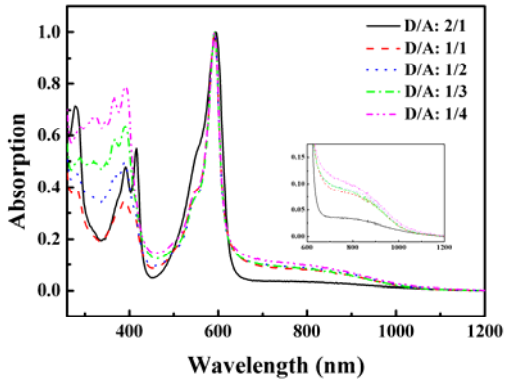

Fig. S2 The absorption spectra of blend thin films of **DHNDI** and **$4NH_2$-NDI** in different molar ratios.

3. DFT calculation data

Calculation data for $4NH_2$-NDI:

		Coordinates(Angstroms)		
		X	Y	Z
1	C	-0.703798	-2.464147	-0.001222
2	C	0.736247	-2.453367	0.000762
3	C	1.422077	-1.229440	-0.038221
4	C	0.706733	0.005211	-0.028848
5	C	-0.706733	-0.005213	0.028847
6	C	-1.408058	-1.249134	0.038029
7	C	1.408057	1.249132	-0.038041
8	C	0.703796	2.464143	0.001211
9	C	-0.736244	2.453363	-0.000748
10	C	-1.422075	1.229438	0.038232
11	C	-2.888598	1.218467	0.018888
12	N	-3.525614	-0.023200	0.007529
13	C	-2.876441	-1.262819	0.019716
14	C	2.888599	-1.218467	-0.018851

15	N	3.525615	0.023201	-0.007534
16	C	2.876440	1.262818	-0.019756
17	N	-1.307921	-3.698781	-0.001336
18	N	1.362765	-3.677581	-0.000827
19	N	1.307916	3.698781	0.001285
20	N	-1.362760	3.677582	0.000883
21	O	-3.554325	-2.298335	0.010155
22	O	3.594471	-2.235402	-0.007346
23	O	-3.594465	2.235404	0.007342
24	O	3.554319	2.298337	-0.010148
25	C	-4.993606	0.003608	-0.014608
26	C	4.993606	-0.003607	0.014604
27	H	-2.320510	-3.656002	-0.088043
28	H	-0.834626	-4.405182	-0.550155
29	H	0.906275	-4.390963	0.553327
30	H	2.374865	-3.614607	0.084459
31	H	2.320508	3.656004	0.087978
32	H	0.834633	4.405195	0.550100
33	H	-0.906285	4.390976	-0.553268
34	H	-2.374863	3.614609	-0.084388
35	H	-5.344232	-1.023893	0.012588
36	H	-5.340671	0.504922	-0.920442
37	H	-5.363030	0.563106	0.846638
38	H	5.344233	1.023892	-0.012656
39	H	5.340673	-0.504863	0.920470
40	H	5.363028	-0.563160	-0.846606

Total energy: -1247.71569169 Hartrees

4. OFET performances of $4NH_2$-NDI, DHNDI, and blend system with D/A molar ratio of 1:3

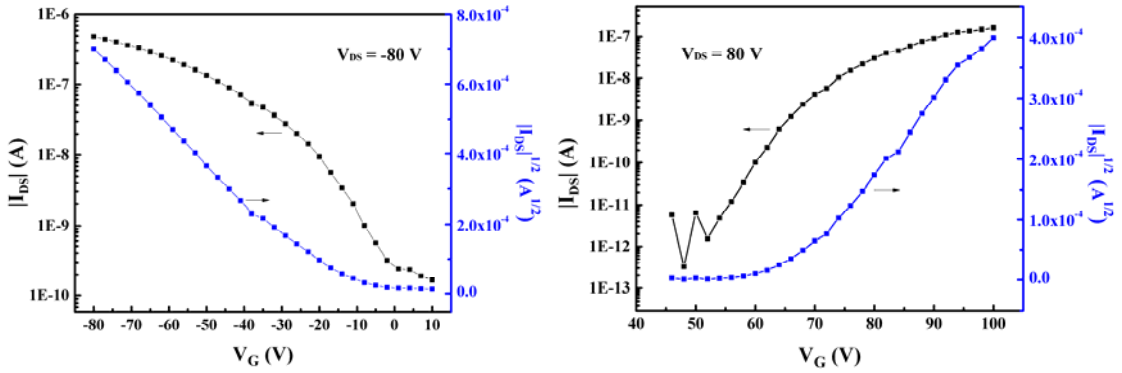

Fig. S3 Transfer characteristics for OFETs of **$4NH_2$-NDI** (*left*, measured in air) and **DHNDI** (*right*, measure in N_2); the channel width (*W*) and length (*L*) were 1440 μm and 50 μm, respectively.

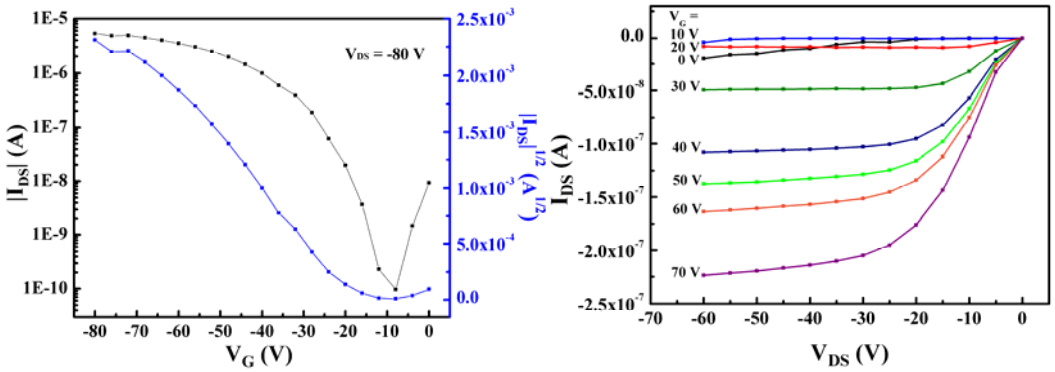

Fig. S4 Transfer (*left*) and output (*right*) characteristics for OFETs of blend system with D/A molar ratio of 1:3 measured in air; the channel width (*W*) and length (*L*) were 1440 μm and 50 μm, respectively.

5. AFM images of thin films of 4NH$_2$-NDI (A) and DHNDI (B) after annealing at different temperatures

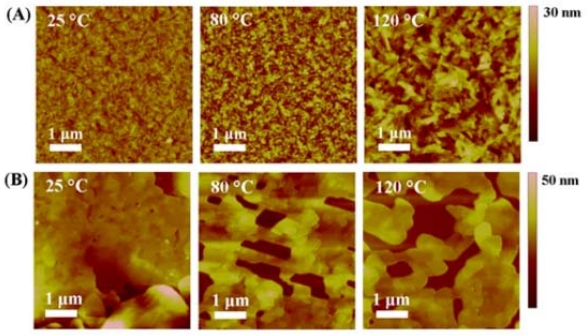

Fig. S5 AFM images of thin films of **4NH$_2$-NDI** (A) and **DHNDI** (B) after annealing at different temperatures.

6. ^{1}H NMR and ^{13}C NMR spectra of 4NH$_2$-NDI and compound 1

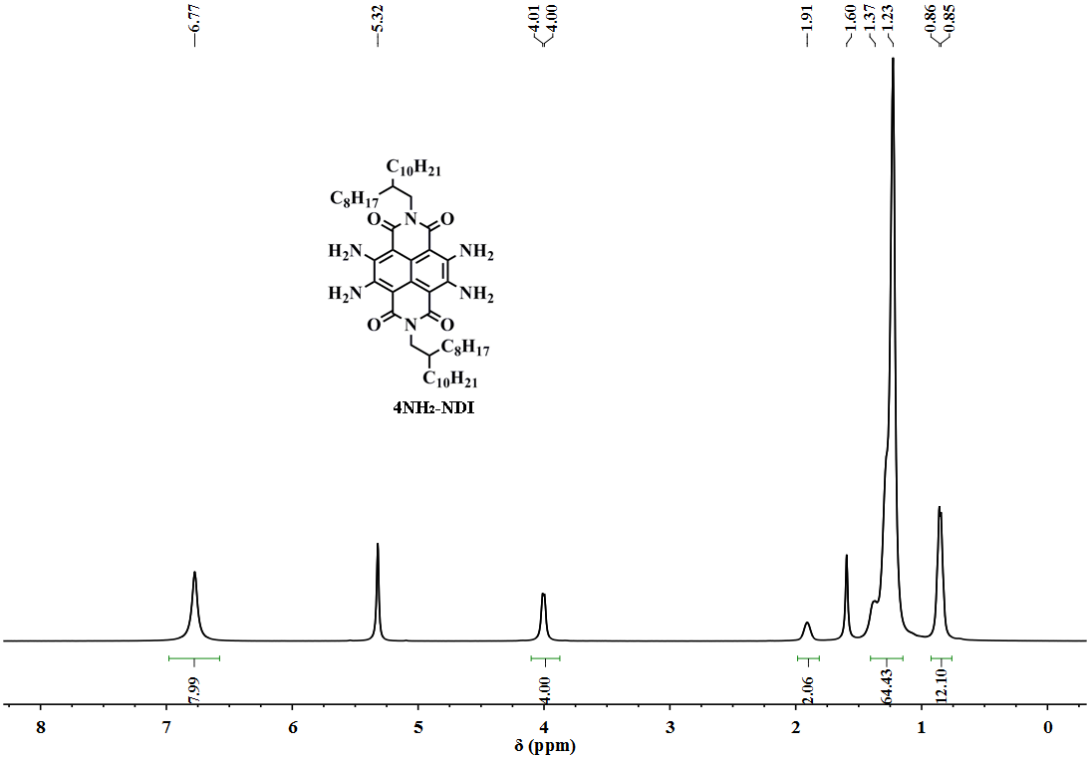

Fig. S6 ^{1}H NMR spectra of **4NH$_2$-NDI**

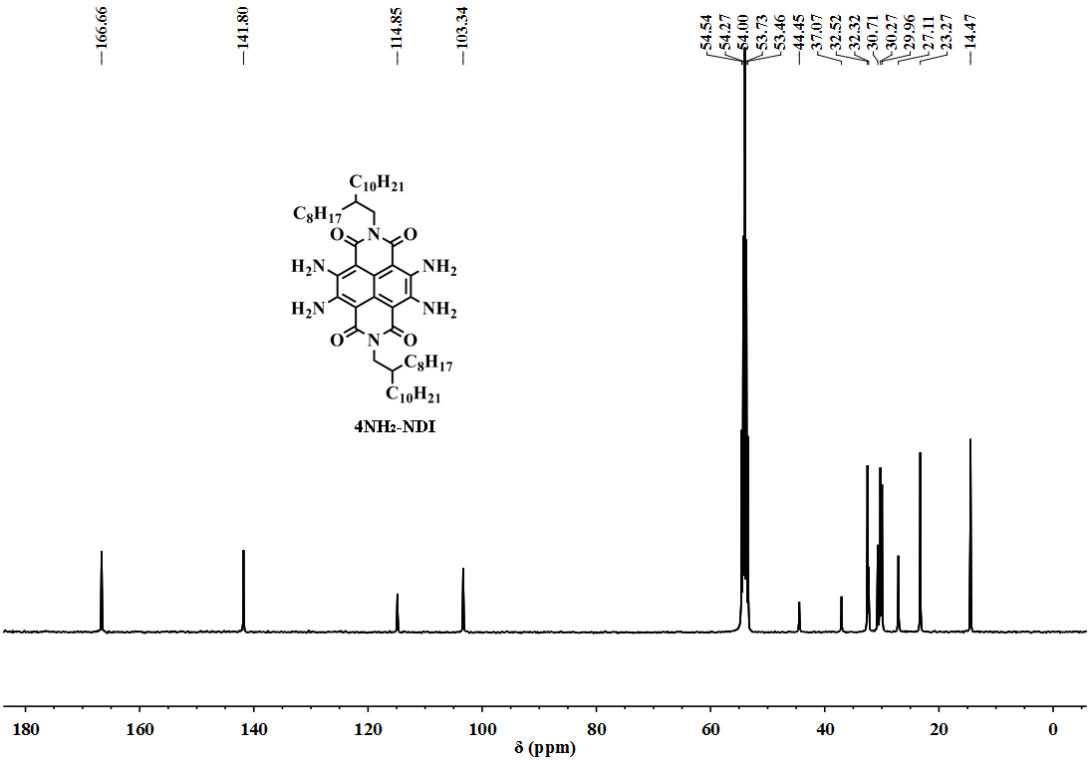

Fig. S7 ^{13}C NMR spectra of **4NH$_2$-NDI**

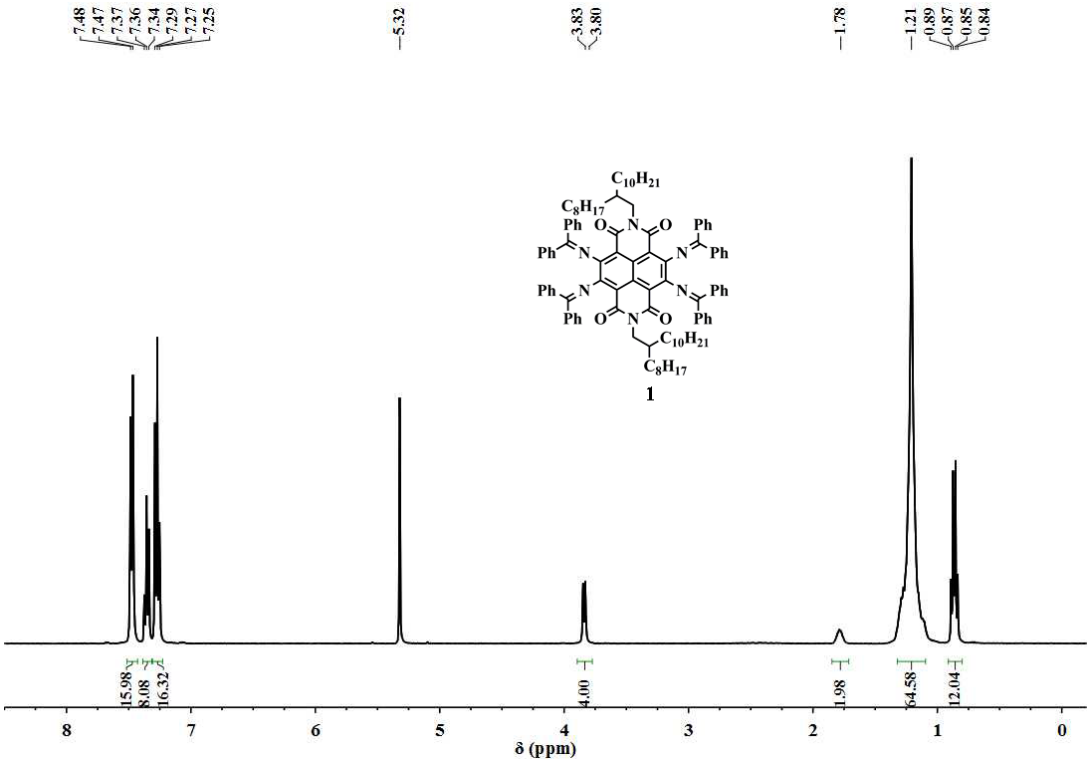

Fig. S8 ^{1}H NMR spectra of **1**

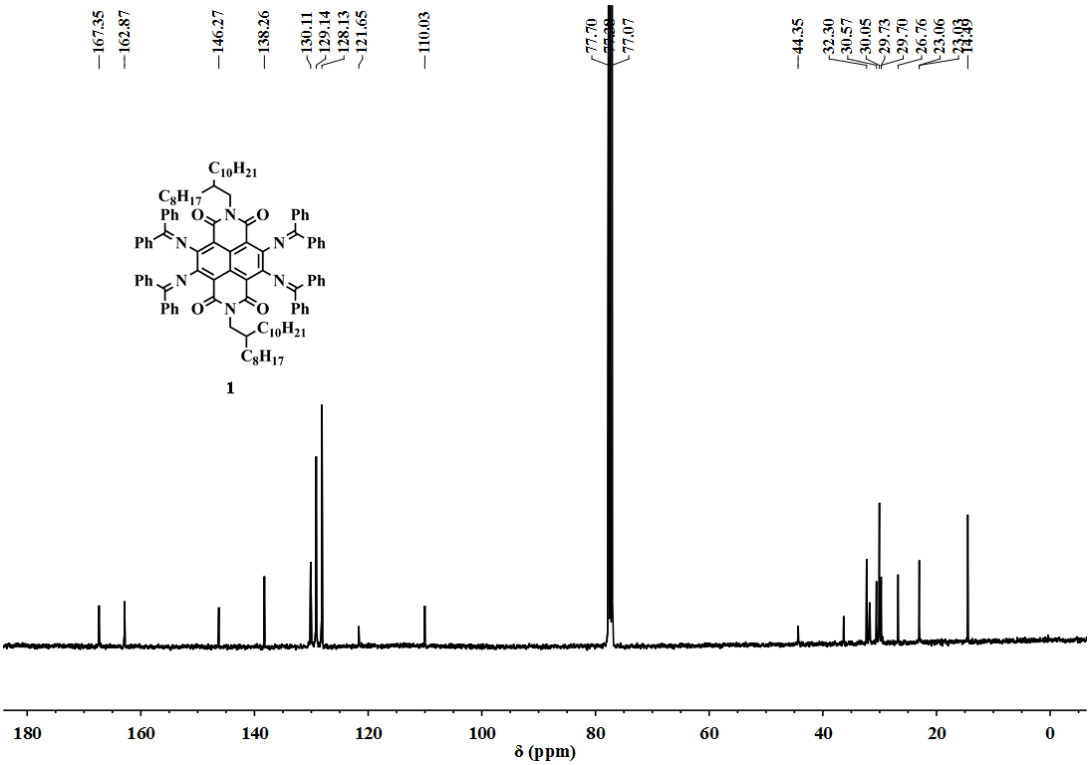

Fig. S9 ^{13}C NMR spectra of **1**