Supporting information

A high-performance ambipolar organic field-effect transistors based on a bidirectional π-extended diketopyrrolopyrrole under ambient conditions

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Contents

1. Table

Table S1. Calculated absorption wavelength (nm), oscillator strength (*f*) and transition nature of DPP-2T2P-2DCV at CAM-B3LYP/6-31g* level of theory in chloroform solvent

State	λ_{max}	*f*	Main contributions	Character
$S_0 \rightarrow S_1$	595.4	2.0101	HOMO->LUMO (88%)	CT(DPP→B-DCV)
$S_0 \rightarrow S_3$	368.3	1.3508	H-2->LUMO (25%), H-1->L+1 (17%), HOMO->L+2 (51%)	CT(DPP→B-DCV)
$S_0 \rightarrow S_6$	335.5	0.4475	H-2->LUMO (46%), HOMO->L+2 (32%)	LE(π→π*)

2. Figures

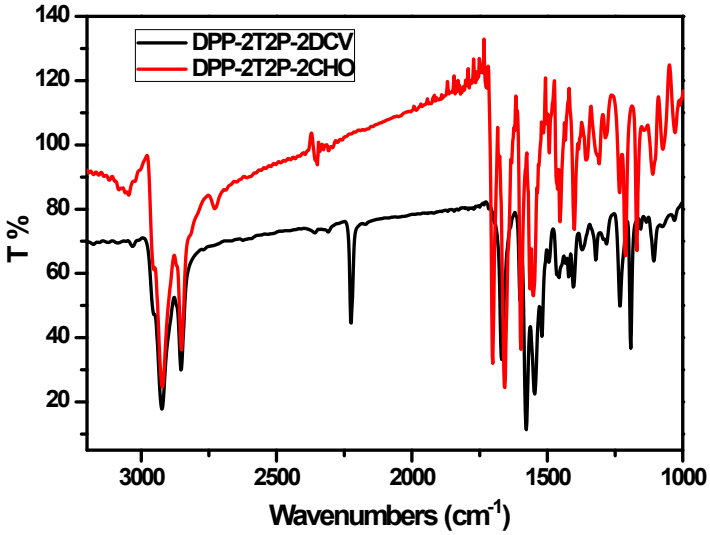


Fig. S1 FT-IR spectrum of **DPP-2T2P-2DCV** and **DPP-2T2P-2CHO**.

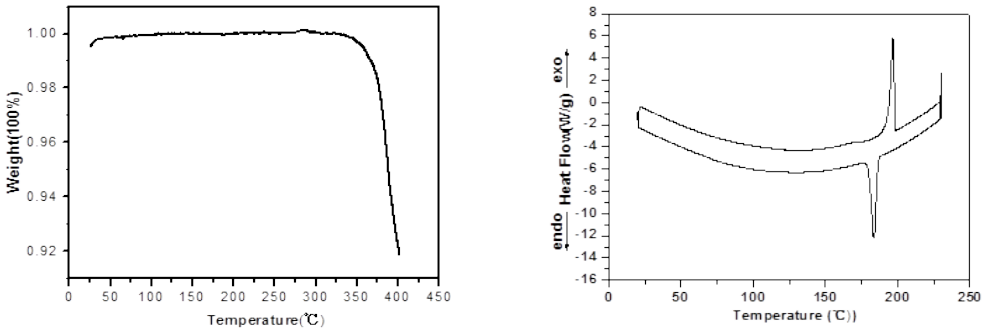


Fig. S2. (left) Thermogravimetric analysis and (right) differential scanning calorimetry curves for **DPP-2T2P-2DCV**.

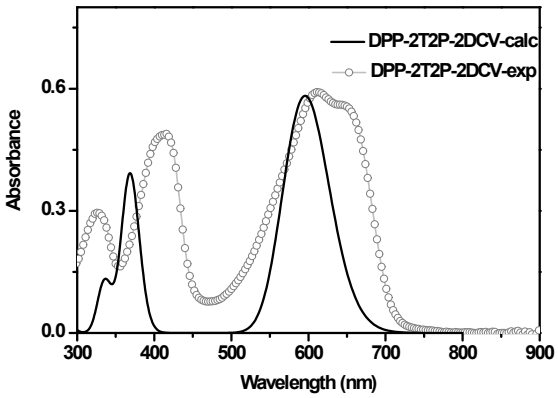


Fig. S3 Calculated absorption spectra of compound **I** (black solid) compared with experimental spectra (white solid) in acetonitrile.

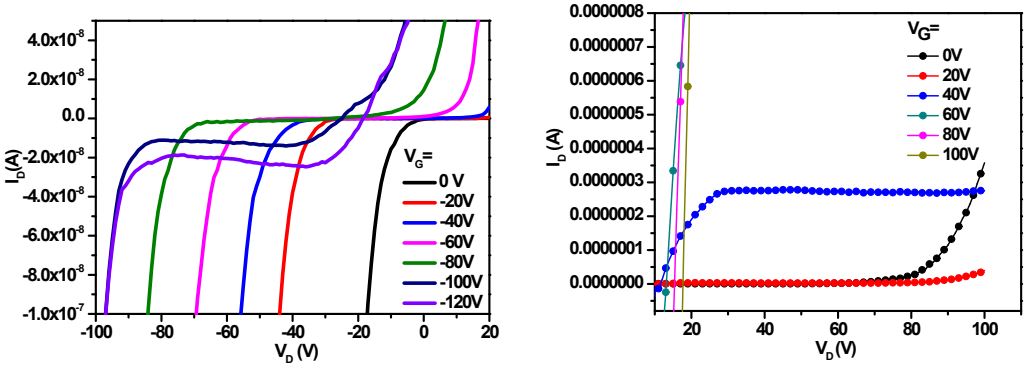
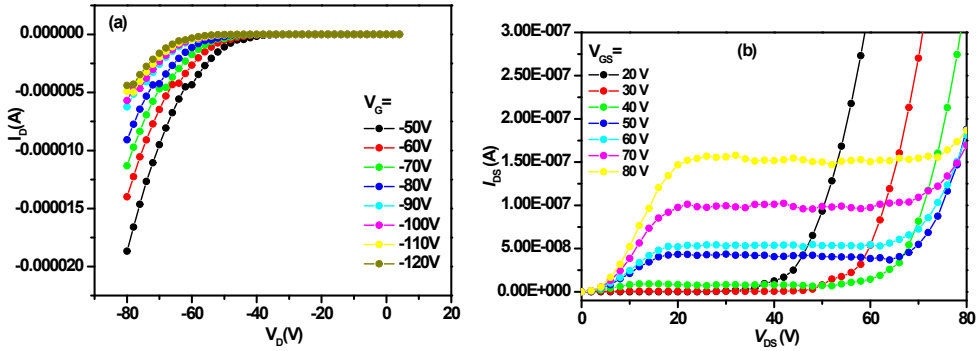


Fig. S4 Typical output curves of the OFET devices in air.



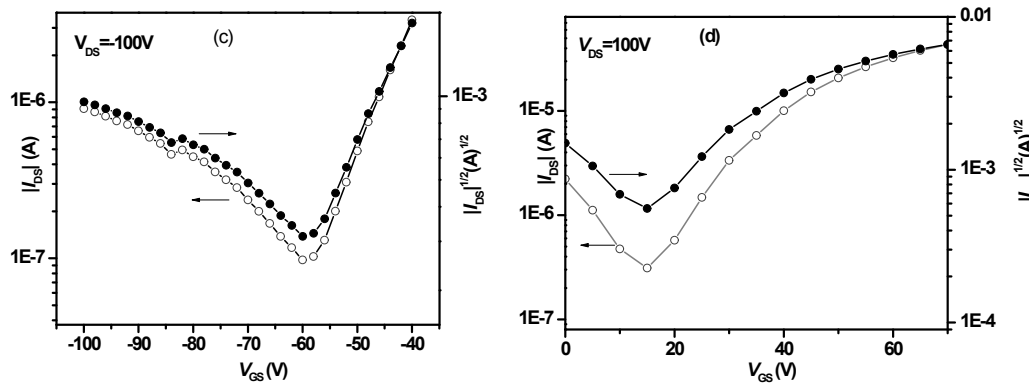


Fig. S5 Typical output (a,b) and transfer (c,d) curves of the OFET devices in nitrogen.

3. Characterization

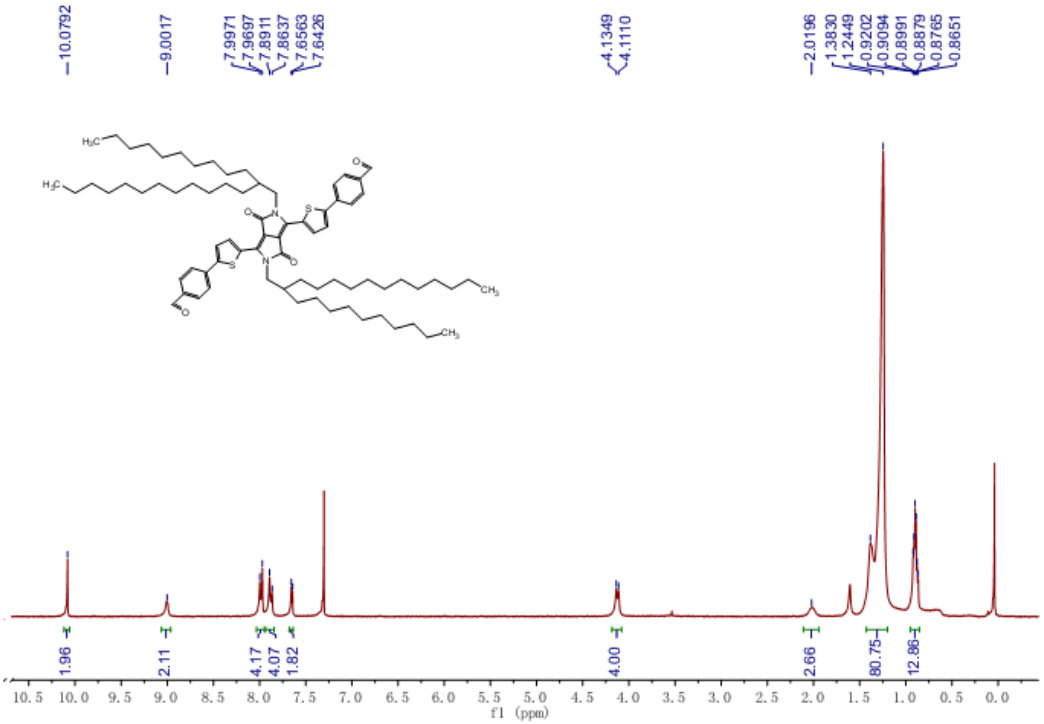


Fig. S6 ^{1}H NMR spectrum of **DPP-2T2P-2CHO** in $CDCl_3$.

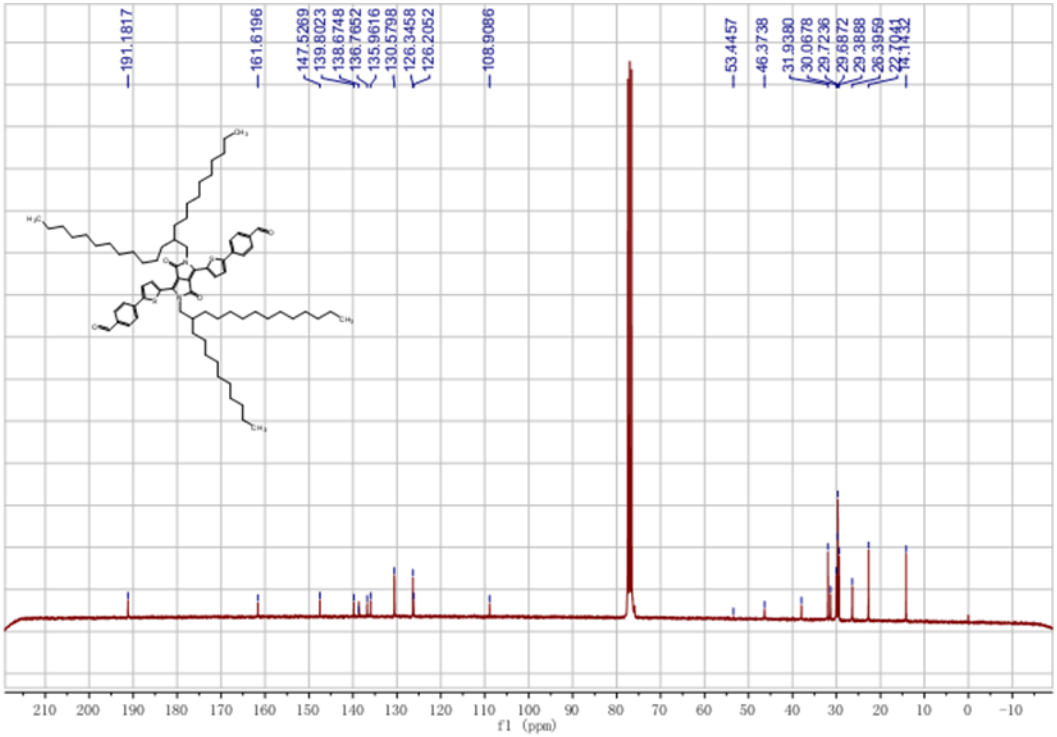


Fig. S7 ^{13}C NMR spectrum of **DPP-2T2P-2CHO** in $CDCl_3$.

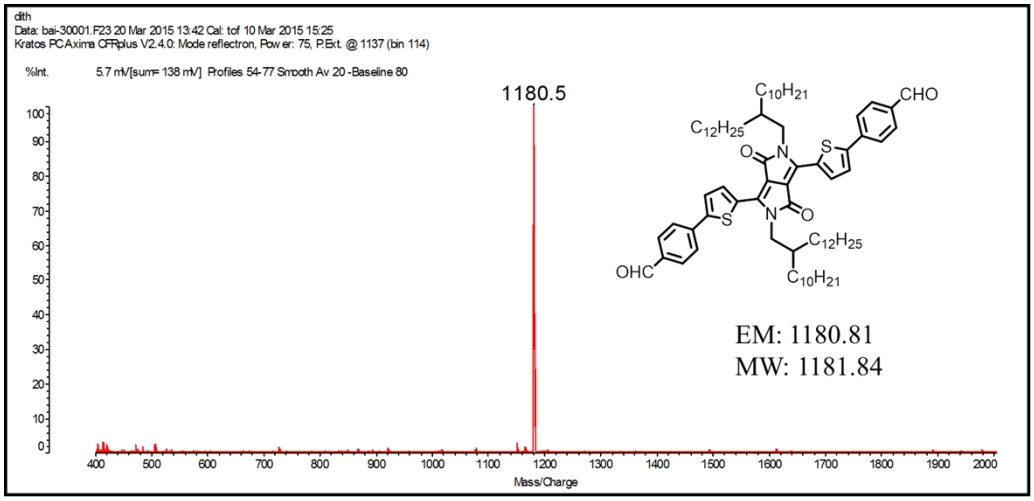


Fig. S8 Mass spectrum of **DPP-2T2P-2CHO**.

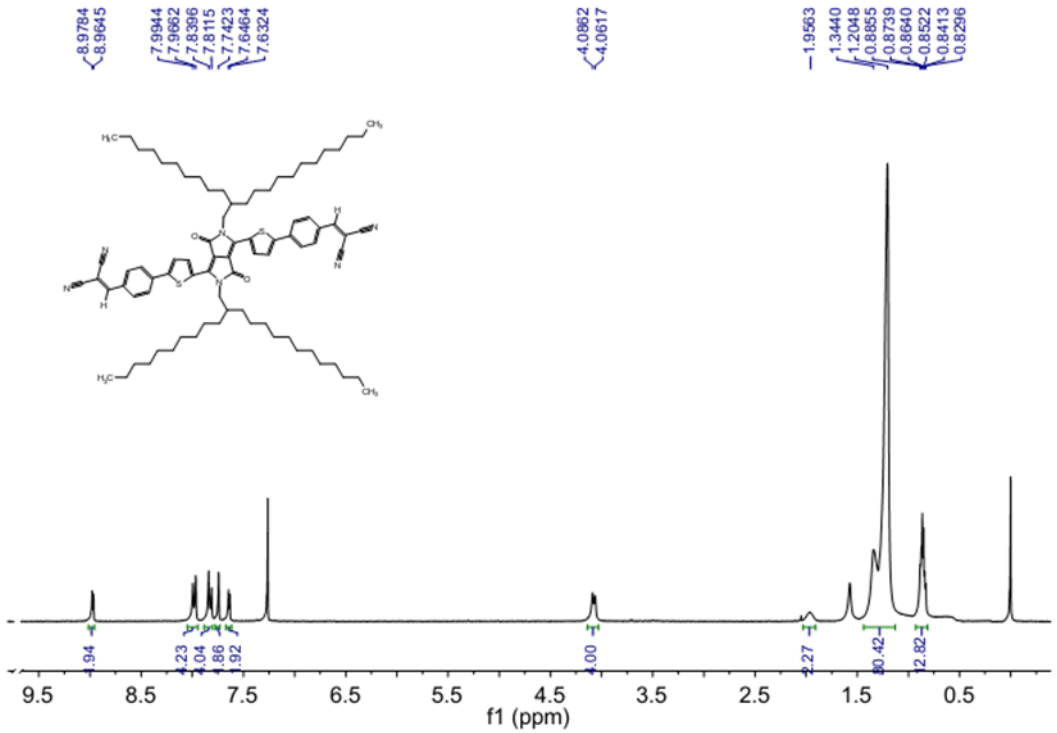


Fig. S9 ^{1}H NMR spectrum of **DPP-2T2P-2DCV** in $CDCl_3$.

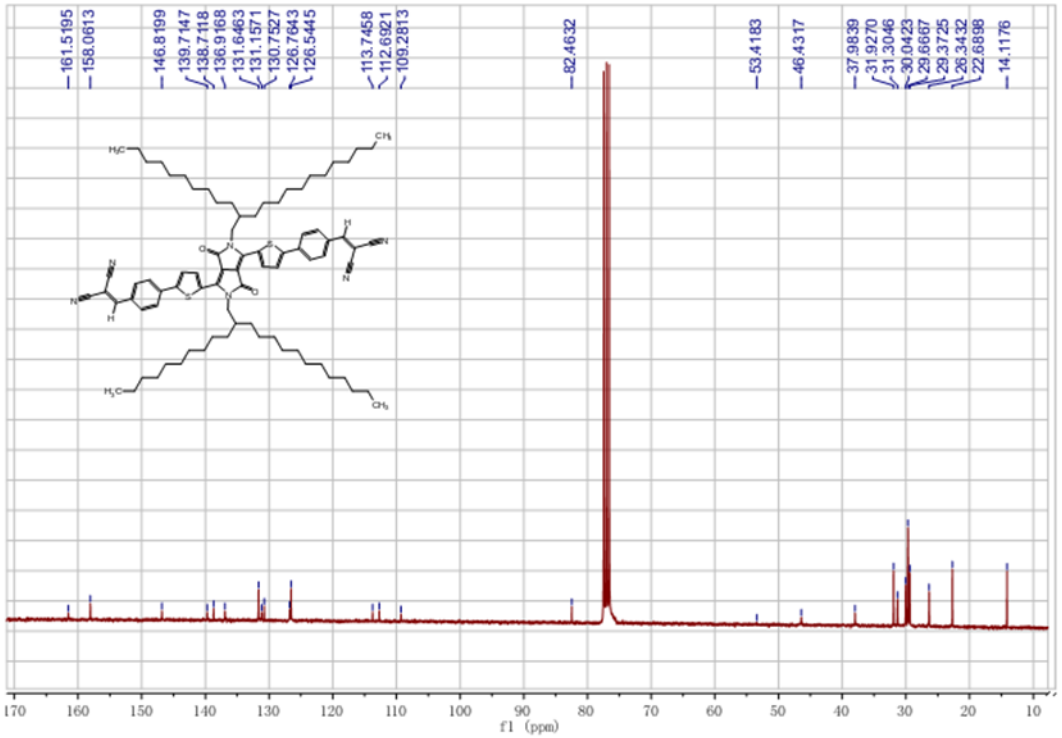


Fig. S10 ^{13}C NMR spectrum of **DPP-2T2P-2DCV** in $CDCl_3$.

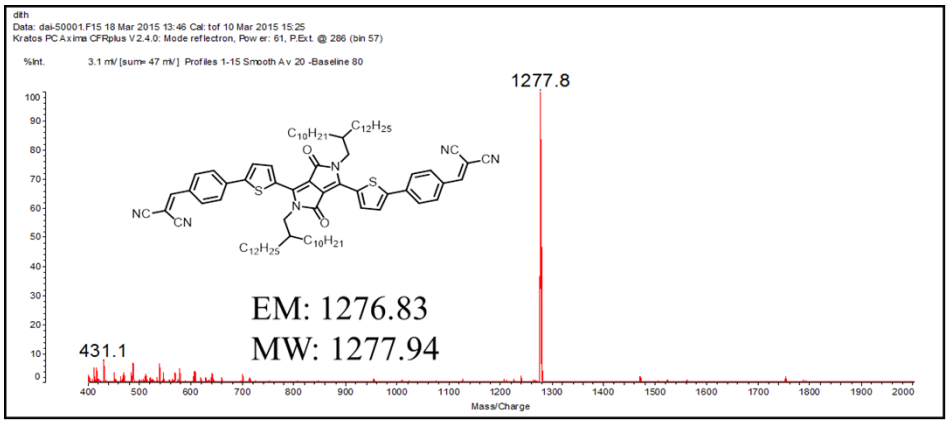


Fig.S11 Mass spectrum of **DPP-2T2P-2DCV**.