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Magnetic-field guided solvent vapor annealing for enhanced molecular alignment and carrier mobility of a semiconducting diketopyrrolopyrrole- based polymer

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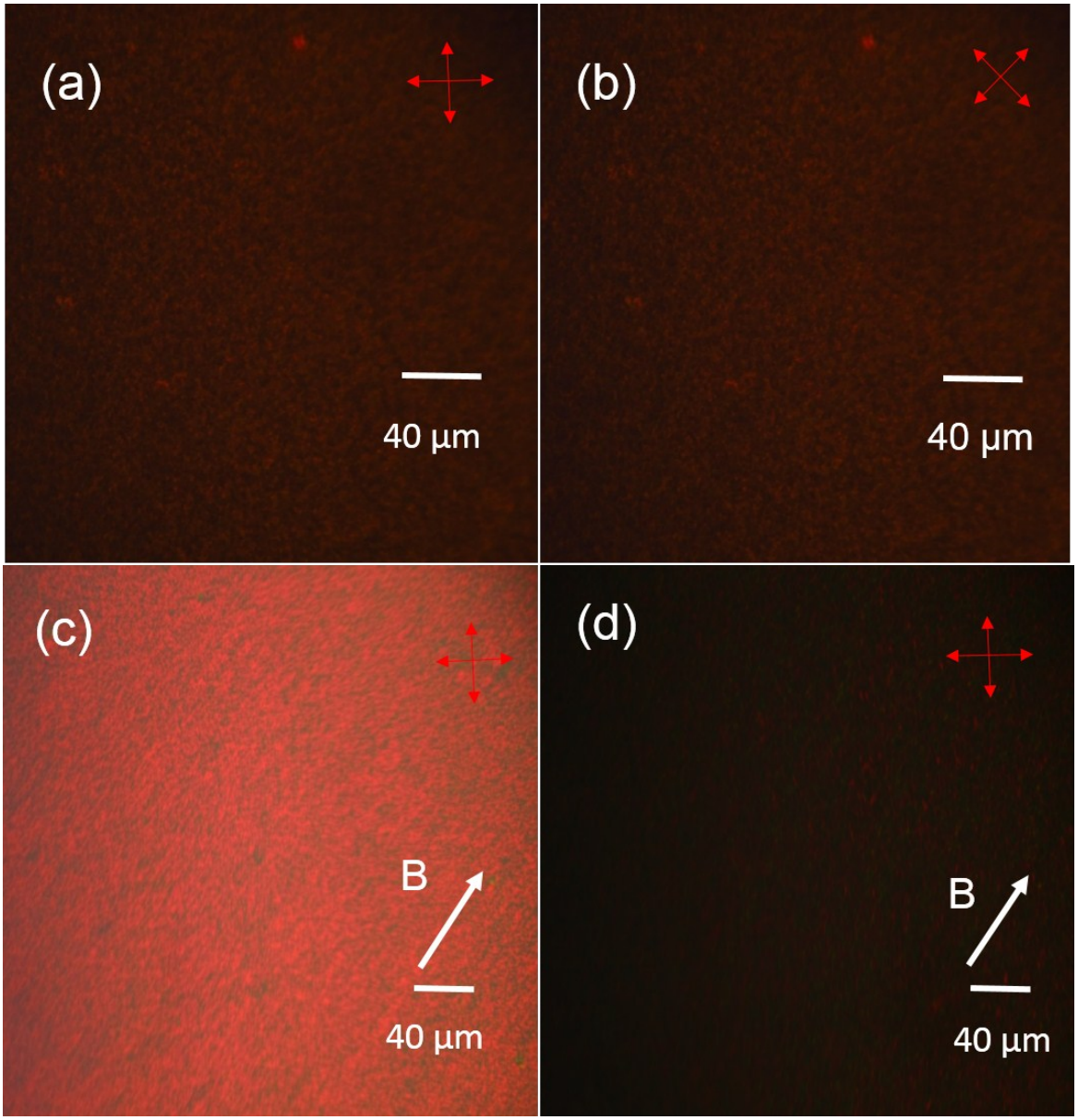

Fig. S1 (a)-(b) POM images of the spin-coated film; (c)-(d) POM images of the aligned P(NDI2OD-T2) film prepared by the solvent vapor annealing under high magnetic field (8T). Red arrows indicate the orientation of the crossed polarizer/analyzer.

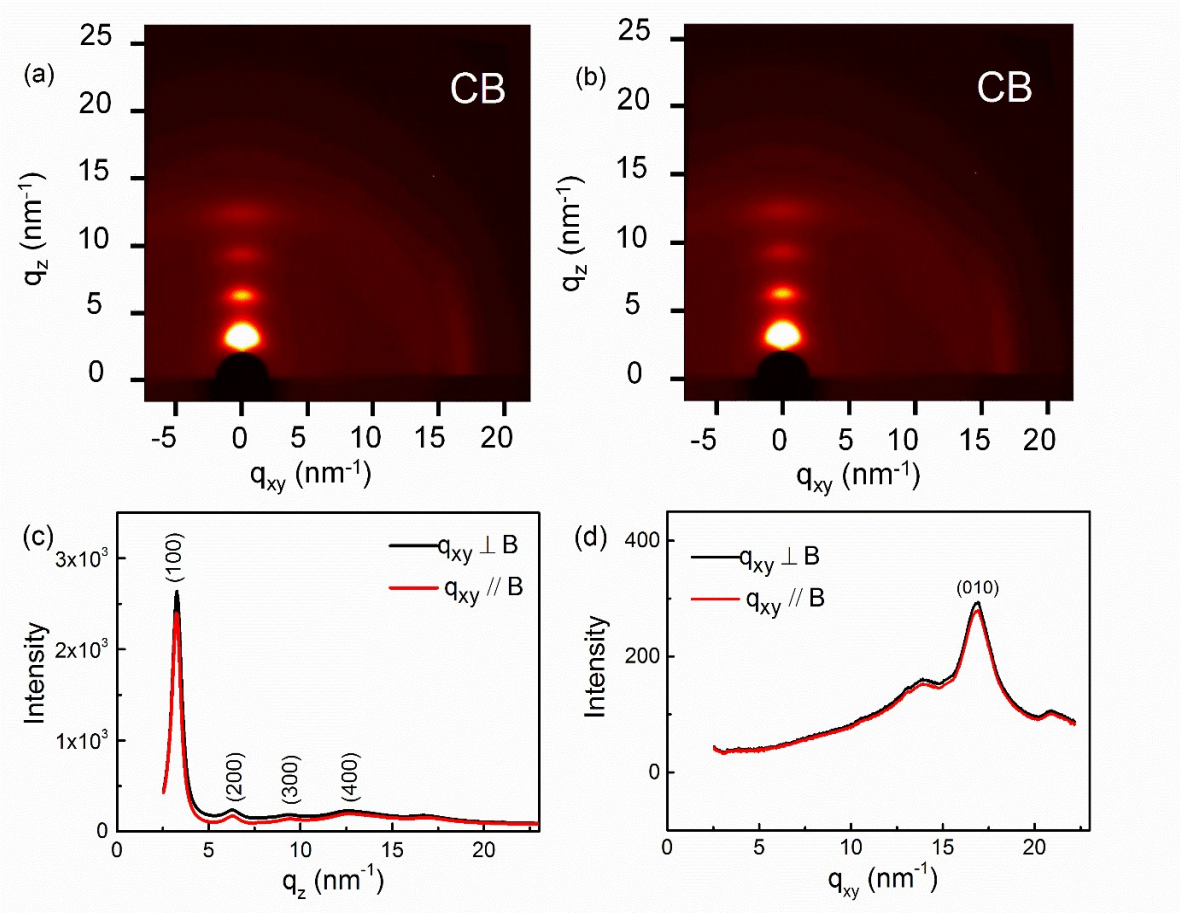

Fig. S2 a-b) 2D GIXRD patterns of the magnetically aligned PDPP2TBT film with in-plane scattering vector q_{xy} nominally perpendicular and parallel to the applied magnetic field direction **B**, respectively. The film was spin-coated from the CB solution on the SiO_2/Si substrate, and then annealed in saturated CB atmosphere under a field of 8 T. c-d) Cross-section profiles of the 2D diffraction patterns in Figure S2 (a) and (b) along the q_z and q_{xy} direction, respectively.

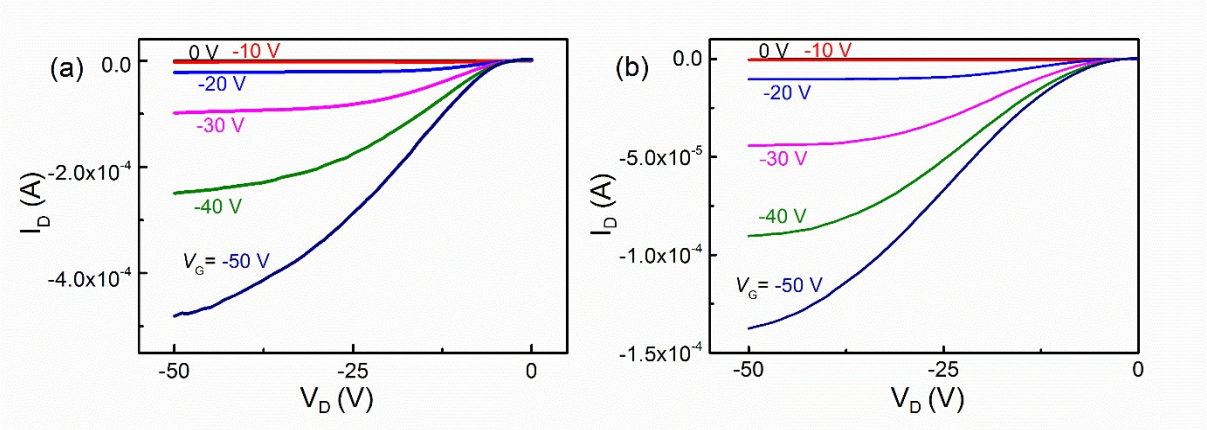

Fig. S3. (a) Output curves of the perpendicular device of the aligned film with the channel

current perpendicular to the direction of magnetic alignment. (b) Output curves of the unaligned devices. Both OFETs were constructed in the bottom-gate/bottom-contact **(BG/BC)** geometry with channel length L of 5 μm and channel width W of 2 mm.

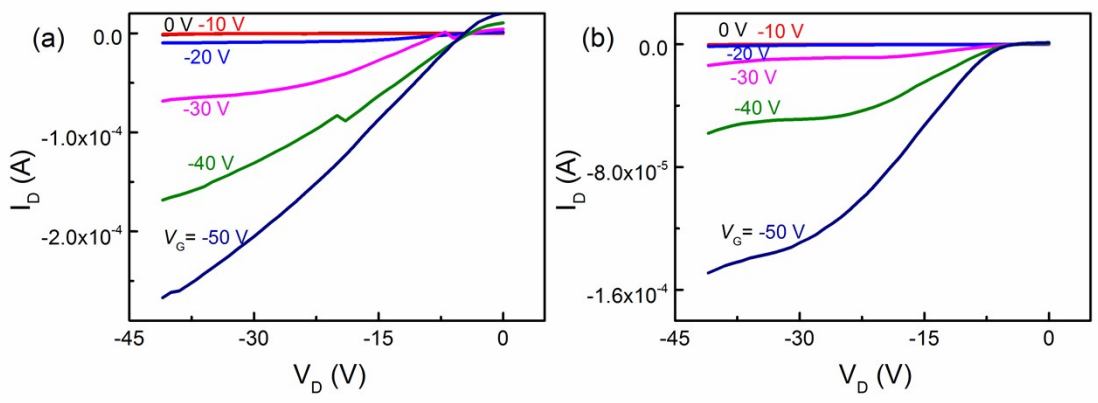

Fig. S4 Output curves of the perpendicular devices of the aligned film (a) and the unaligned devices (b), respectively. Both OFETs were constructed in the top-gate/bottom-contact (**TG/BC**) geometry with channel length L of 5 μm and channel width of 2 mm.

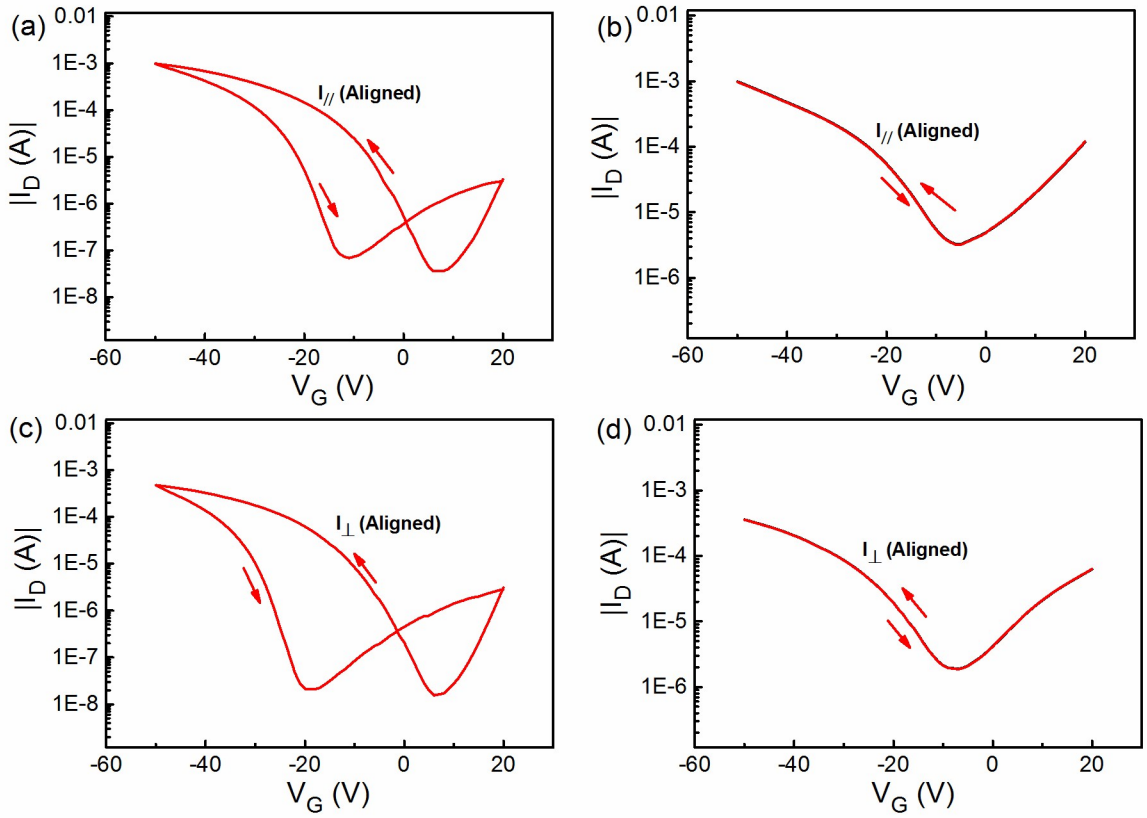

Fig. S5 (a-b) The transfer curves at the forward and reverse scans for the BG/BC (a) and TG/BC devices (b) of the aligned PDPP2TBT films with the channel current parallel to the

direction of magnetic alignment, respectively. (c-d) The transfer curves at the forward and reverse scans for the BG/BC (c) and TG/BC devices (d) of the aligned PDPP2TBT films with the channel current perpendicular to the direction of magnetic alignment, respectively.

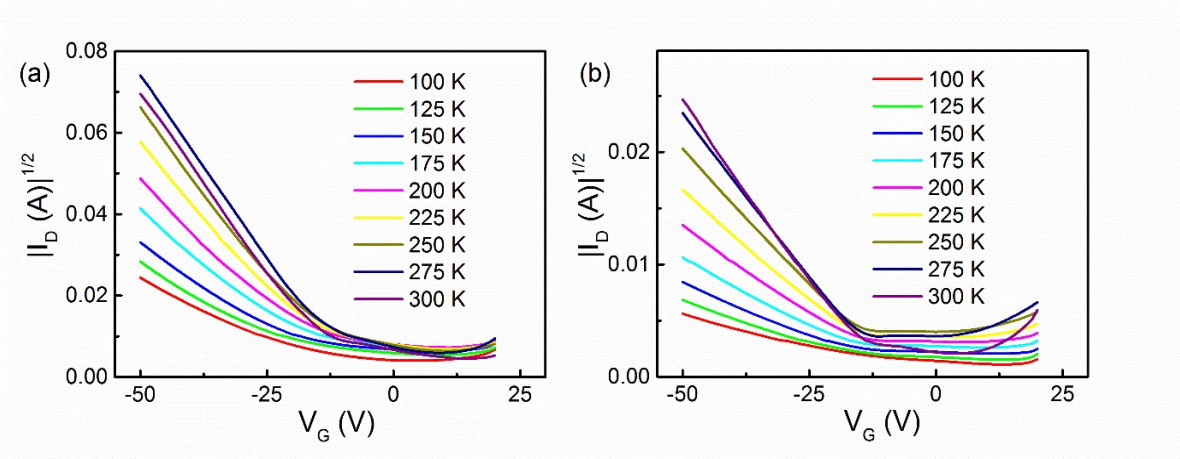

Fig. S6. T-dependent transfer characteristics of the aligned devices of PDPP2TBT (the channel current is parallel to the direction of magnetic alignment) (a) and of the unaligned devices (b), respectively. The OFETs were constructed in the TG/BC geometry with the L of 2.5 μm and W of 2 mm.