

Supporting Information

Table S1 A summary of the physical parameters of the solvents used in this work

	Toluene	Carbon tetrachloride	Isopropanol
Boiling point (°C)	110.6	76.8	82.45
Surface tension (dyn cm ⁻¹)	28.5	45	22.6

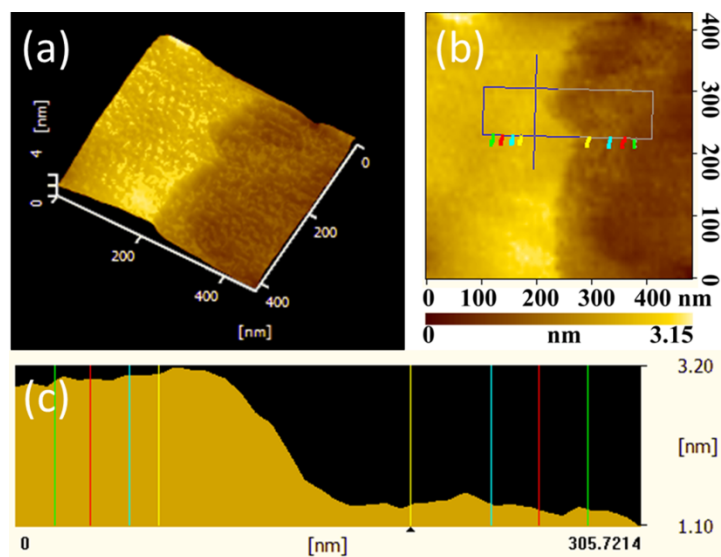
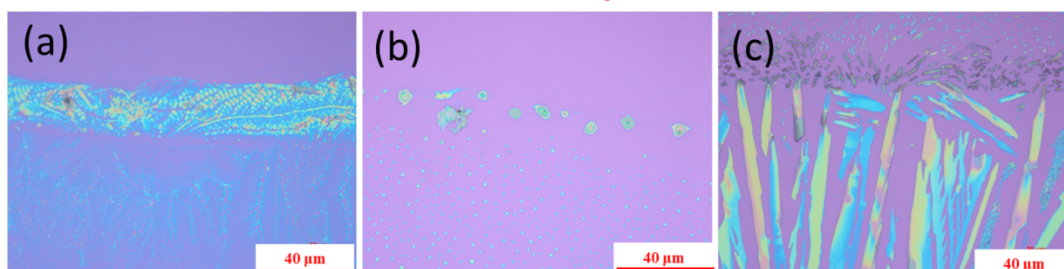


Fig S1. AFM images of the solution grown crystals of TIPS pentacene. (a) three dimensional (b) two dimensional (c) clearly show monomolecular steps with the height of 1.7 nm that corresponds to the c-axis length of the TIPS pentacene molecules, when scanned on the enclosed area in the black rectangle of Fig S1(b).

The nucleation process



The steady growth process

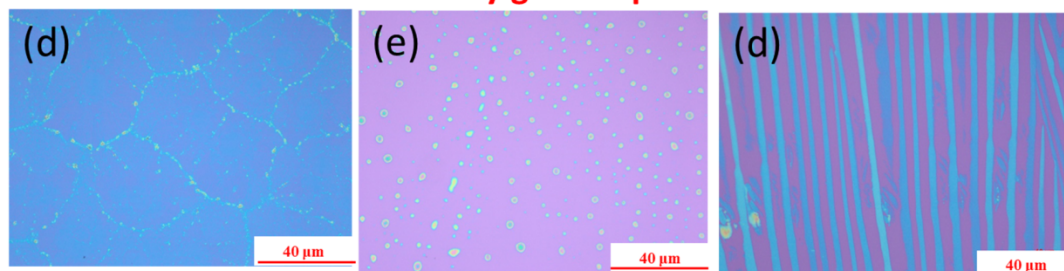


Fig S2 Microscope image of TIPS pentacene crystals from different solvent systems.(a)(d) the single solvent of toluene, (b)(e) the single solvent of carbon tetrachloride,(c)(f) the mixed solvent of 50 vol % toluene, 50 vol % carbon tetrachloride. Figure (a)(b)(c) are for the nucleation process of the crystals, and Figure (d)(e)(f) are for the steady growth process of the crystals.

As is clearly shown in Fig (a) to (c), at the beginning, thick crystals formed near the contact line for all the three solvent systems as a result of the highest concentration of solution near the contact line. When it comes to the steady growth process, the width of the crystals got narrow and the thickness got smaller compared with the crystals near the initial contact line.

It's shown that for the crystals fabricated from the mixed solvent, the crystals grew almost in the same direction (from the contact line to under the contact line) both in the nucleation process and in the steady growth process. However, for the single solvent system, the crystals grew without orientation. Isolated crystals formed on the substrate for the single solvent of toluene, which was similar to the coffee ring-like crystals. For the single solvent of carbon tetrachloride, although the coverage was higher than the toluene system, the crystals were not aligned.

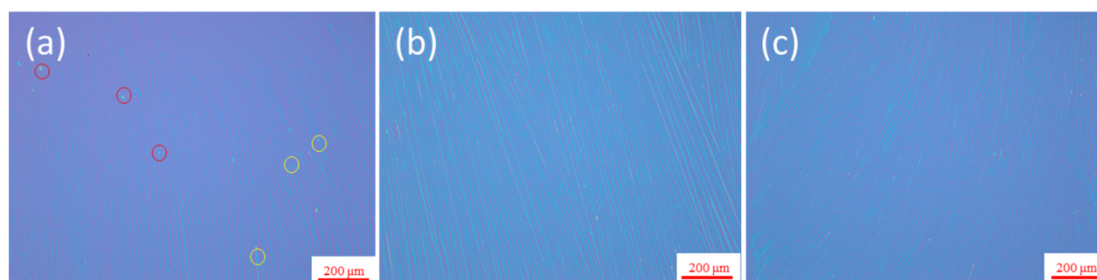


Fig S3. Microscope image of TIPS pentacene single crystals from the mixed solution with different solvent composition. (a) 75 vol % toluene, 25 vol % carbon tetrachloride (b) 50 vol % toluene, 50 vol % carbon tetrachloride (c) 25 vol % toluene, 75 vol % carbon tetrachloride (the red circle in S1a indicate the location of spherulites and the yellow circle indicate the location of the branched crystals).

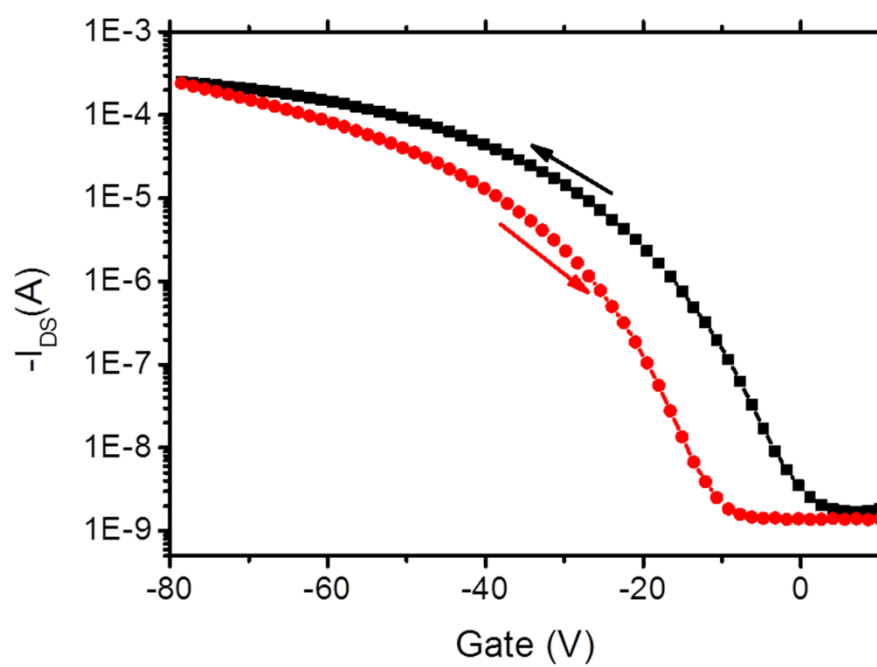


Fig S4. Hysteresis behavior of OTFT devices based on TIPS pentacene crystals.