

Supplementary Information

Solution-processed small molecule transistors with low operating voltages and high grain-boundary anisotropy

Liyang Yu,^{*1,2} Xiaoran Li,^{*3,4} Jeremy Smith,^{2,5} Steven Tierney,⁶ Richard Sweeney,¹ B. K. Charlotte Kjellander,⁴ Gerwin H. Gelinck,⁴ Thomas D. Anthopoulos,^{2,5} Natalie Stingelin^{1,2,7}

¹Department of Materials, Imperial College London, SW7 2AZ London, UK, ²Centre for Plastic Electronics, Imperial College London, SW7 2AZ London, UK, ³Department of Chemical Engineering and Chemistry, Technische Universiteit Eindhoven, P.O. Box 513, 5600 MB Eindhoven, the Netherlands, ⁴Holst Centre/TNO, High Tech Campus 31, 5656 AE Eindhoven, the Netherlands, ⁵Department of Physics, Imperial College London, SW7 2AZ London, UK, ⁶Merck Chemicals Ltd., University Parkway, Southampton SO16 7QD, UK, ⁷FRIAS, School of Soft Matter Research, University of Freiburg, 79104 Freiburg, Germany

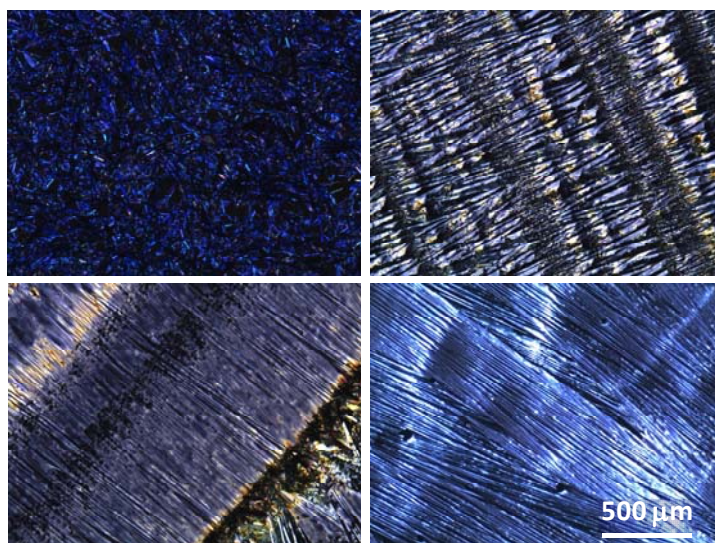


Figure S1. Polarized optical micrographs of BTE-TIPS thin films, solution-cast, respectively, from 0.5 wt% chloroform solutions at room temperature (top left); 0.5 wt% decalin solutions at 100 °C (top right); 0.5 wt% decalin solution at 150 °C (bottom left); 0.5 wt% xylene solution at 100 °C (bottom right).

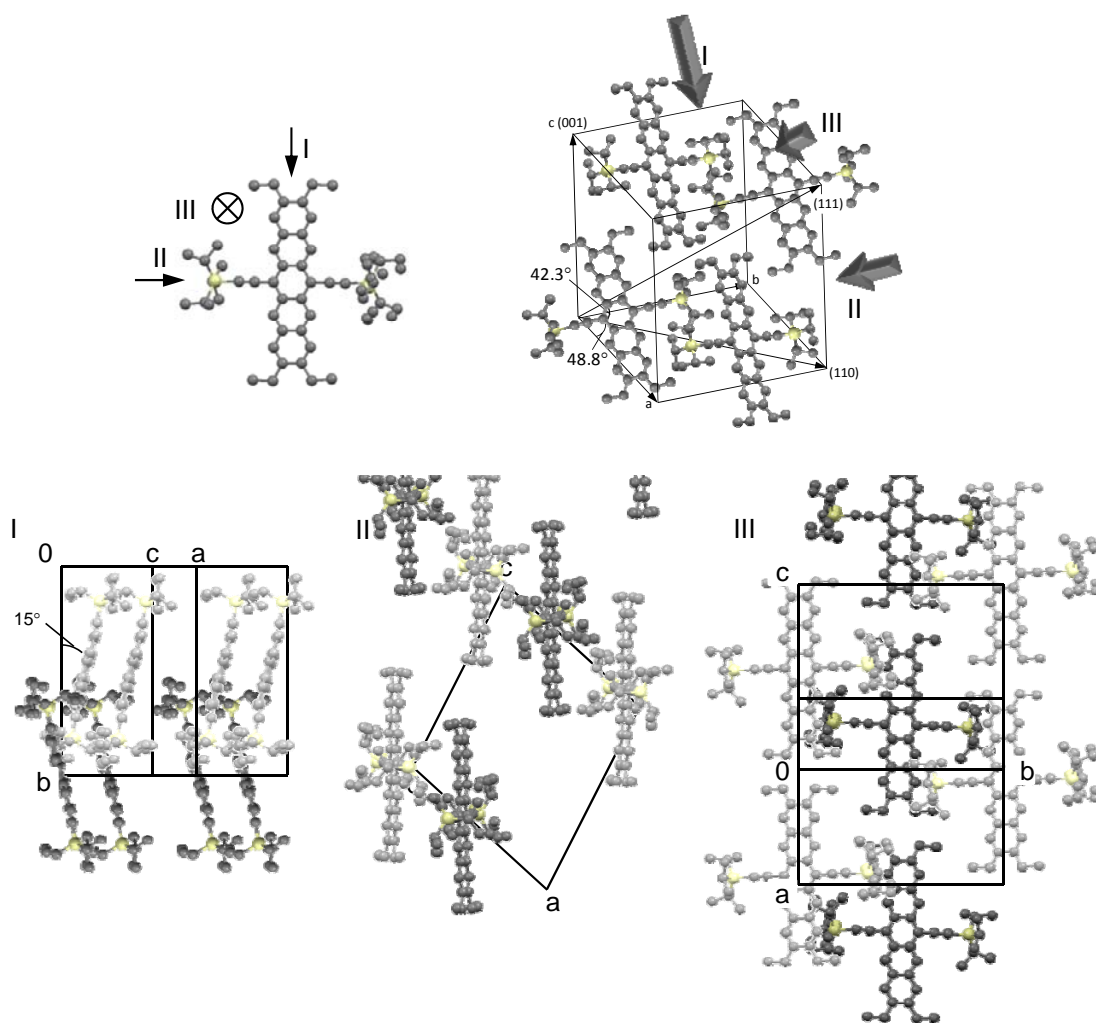


Figure S2. Molecular packing of BTE-TIPS cast from decalin. Top: BTE-TIPS molecule (left) and crystal unit cell (right) with the relevant molecular directions (i.e. along the side chain (I), along the backbone (II) and along the π - π stack are indicated (III)) indicated with arrows. Bottom: View of the unit cell, left, along the side chain (I); middle: the backbone (II); and right: the π - π stack.

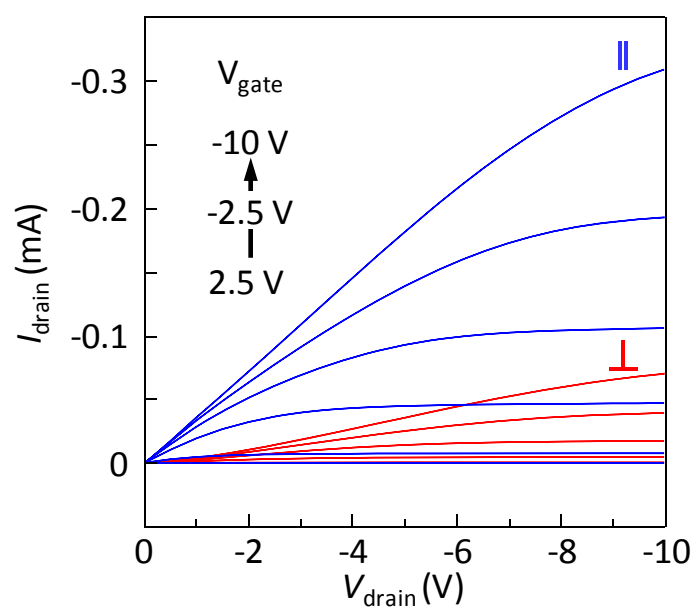


Figure S3. Typical output characteristics of BTE-TIPS in bottom-gate/bottom-contact transistors with, needles oriented parallel (blue) and perpendicular (red) to the source-drain bias direction.