

Supporting information

Decoding the vertical phase separation and its impact on C8-BTBT:PS transistors properties

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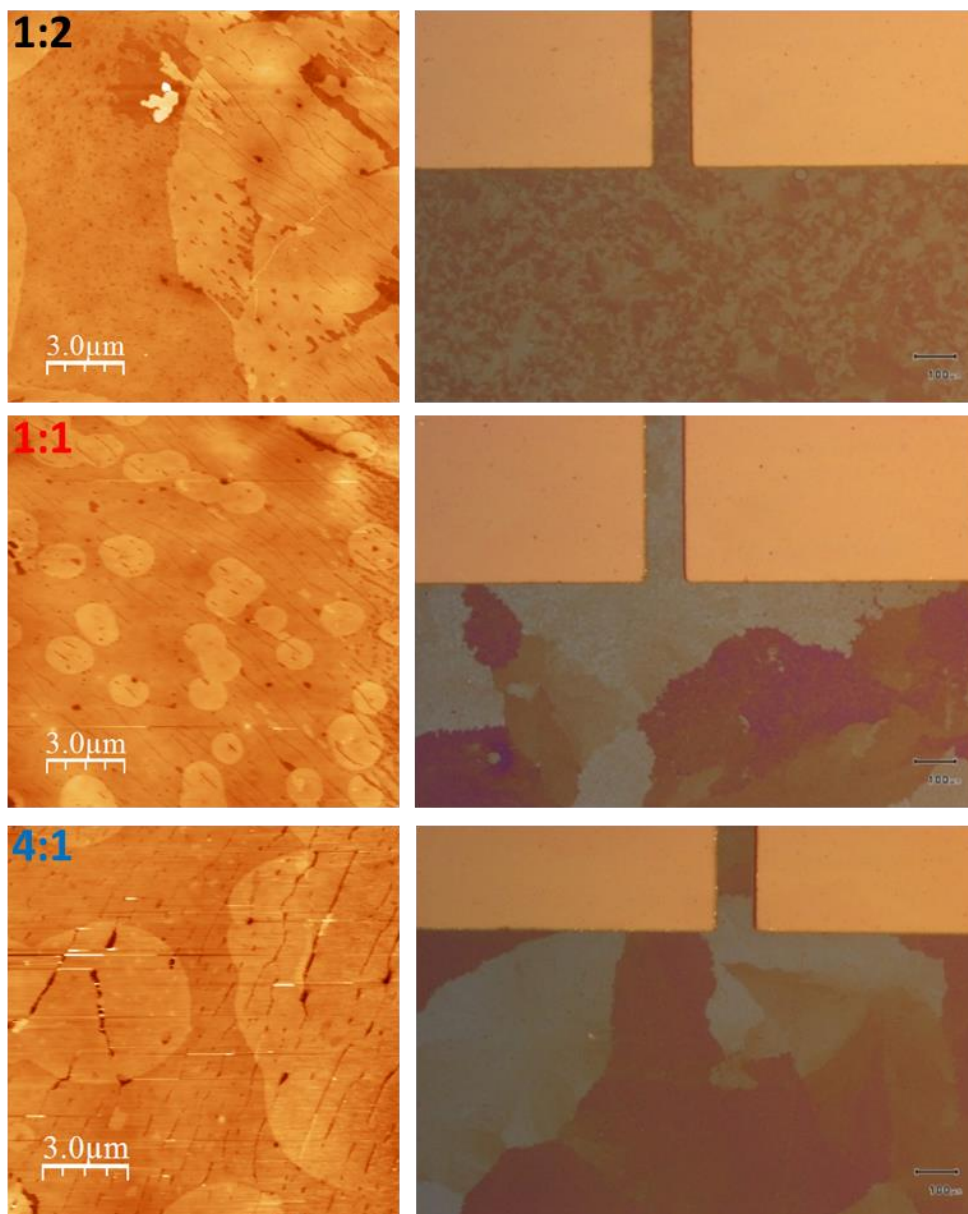


Figure S1: Topographic AFM (left) and optical (right) images of three different devices fabricated using different C8-BTBT:PS ratios (1:2, 1:1 and 4:1). Though the features observed in the optical micrographs show a correspondence with C8-BTBT content, AFM indicates that the films surfaces have not correlation with C8-BTBT:PS ratios nor drastic differences in morphology.

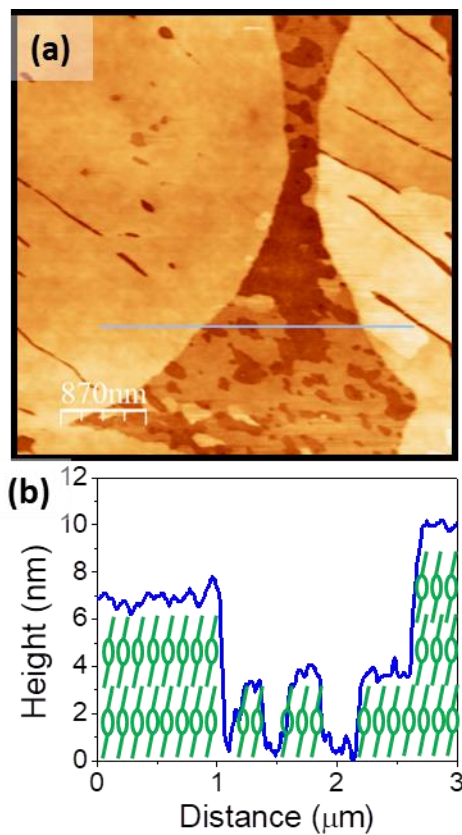


Figure S2. (a) Topographic AFM image of a detail within the channel of a C8-BTBT:PS with 1:2 ratio OFET and (b) morphological profile along the marked line in (a). A cartoon with molecules at scale has been included to illustrate the proposed molecular packing and layer thickness.

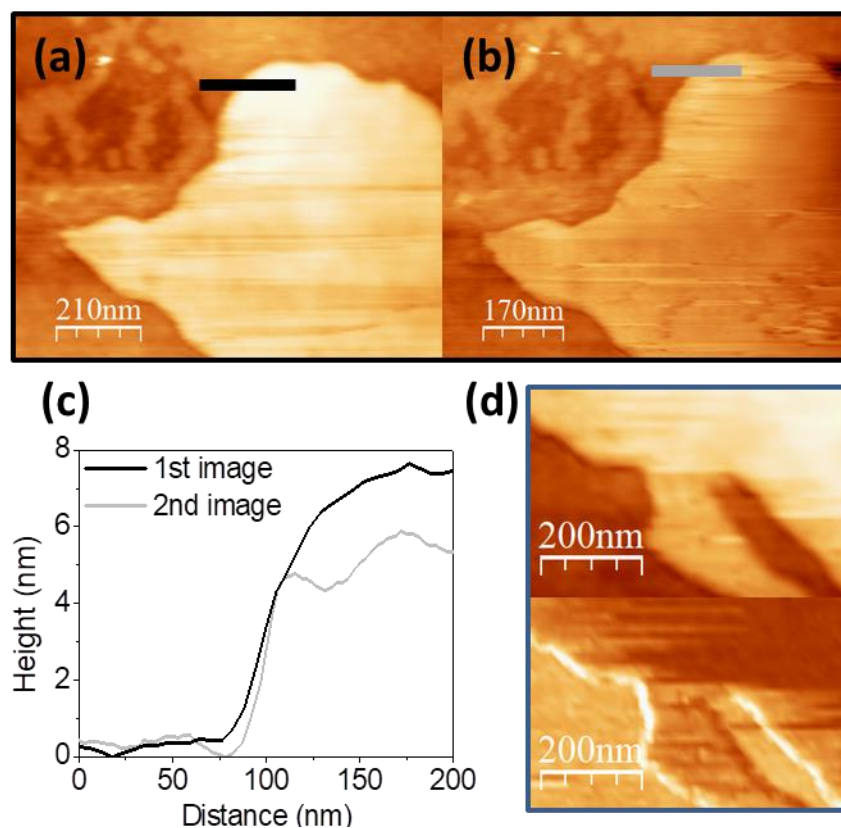


Figure S3. (a) and (b) consecutive topographic AFM images showing that the PS skin layer existing on the surface top can be removed by the sweeping action of the AFM tip. The thickness of this ultrathin PS layer can be quantified from profile analysis between the two images (c). (d) Topography (up) and forward lateral force (bottom) images during PS layer removal illustrating the difference in friction corresponding to PS and C8-BTBT (see manuscript text).

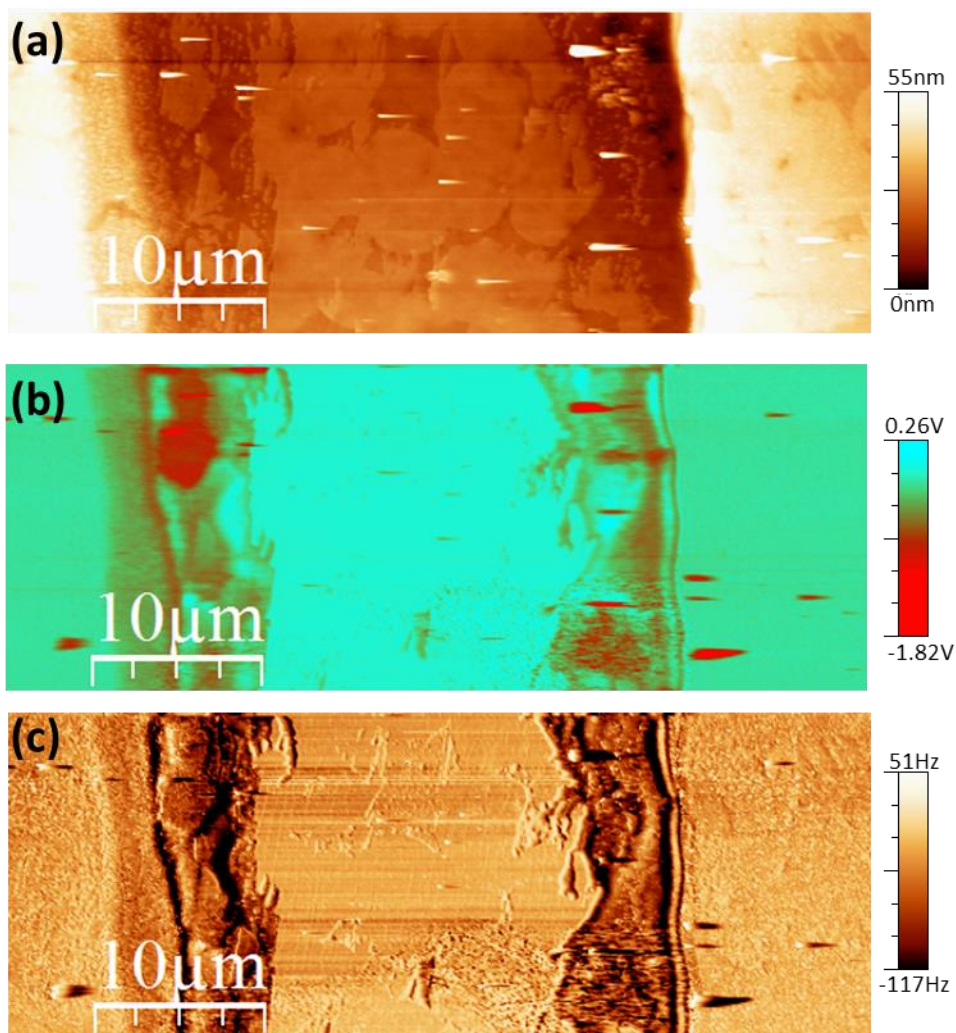


Figure S4. (a) Topographic, (b) KPFM and (c) excitation images taken in the C8-BTBT:PS OFET with 1:2 ratio. In addition to the channel, the two electrode edges of the device are imaged to illustrate the defective characteristics of the film at the channel-electrode boundaries.

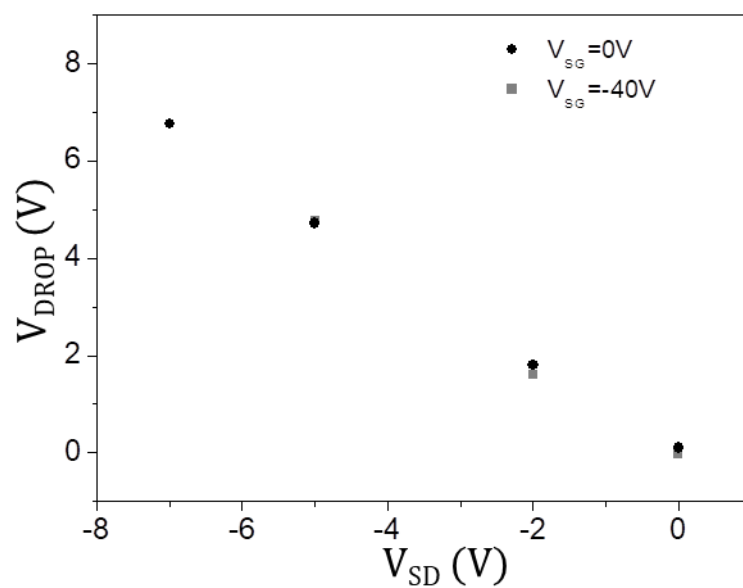


Figure S5. Measured V_{DROP} in the CPD profiles as function of the applied V_{SD} showing a linear dependence for the device with 4:1 ratio of C8-BTBT:PS and Au/MoOx contacts.

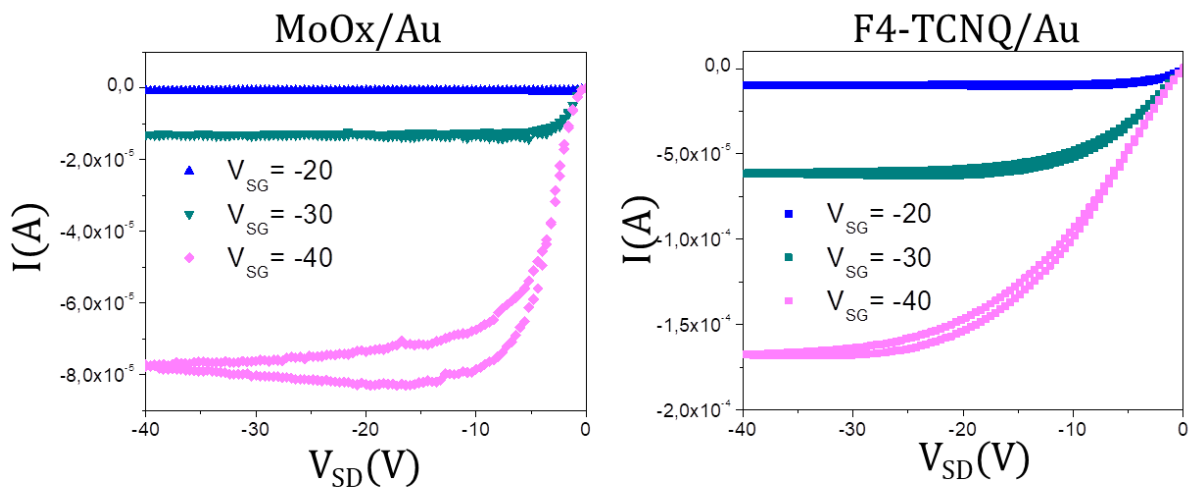


Figure S6: Output characteristics corresponding to the devices whose transfer characteristics are plotted in Figure 6 (b) of the main manuscript.