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# Organosilicon dimer of BTBT as a perspective semiconductor material for toxic gas detection with monolayer organic field-effect transistor

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## Contents



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# 1. Morphology investigations

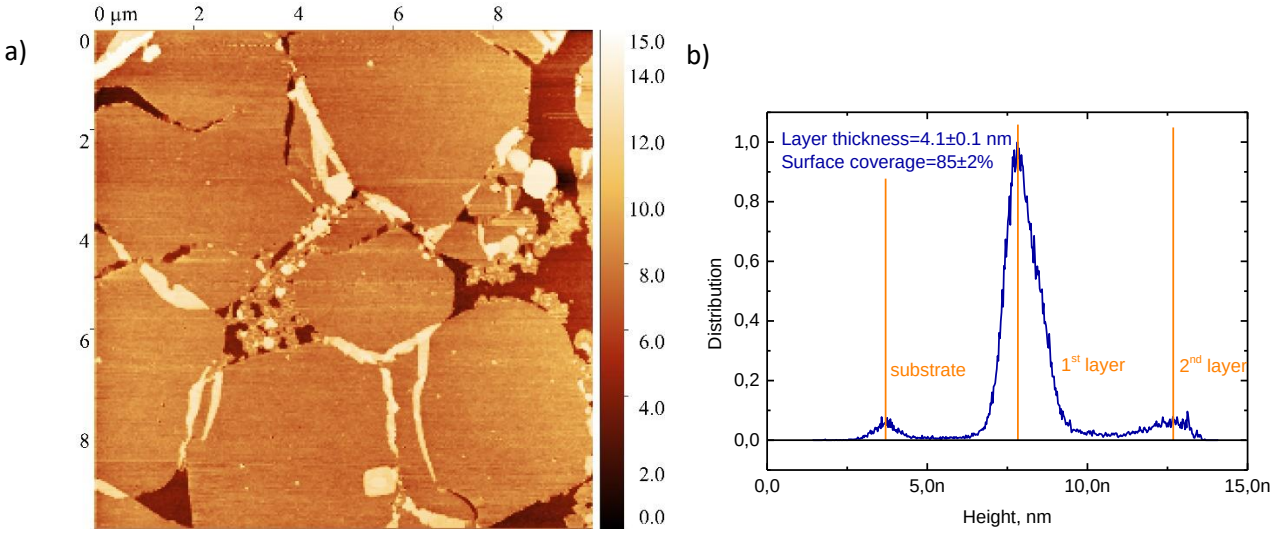


Figure S1. AFM image and height distribution for LB monolayer of quaterthiophene dimer **D2-Und-4T-Hex**.

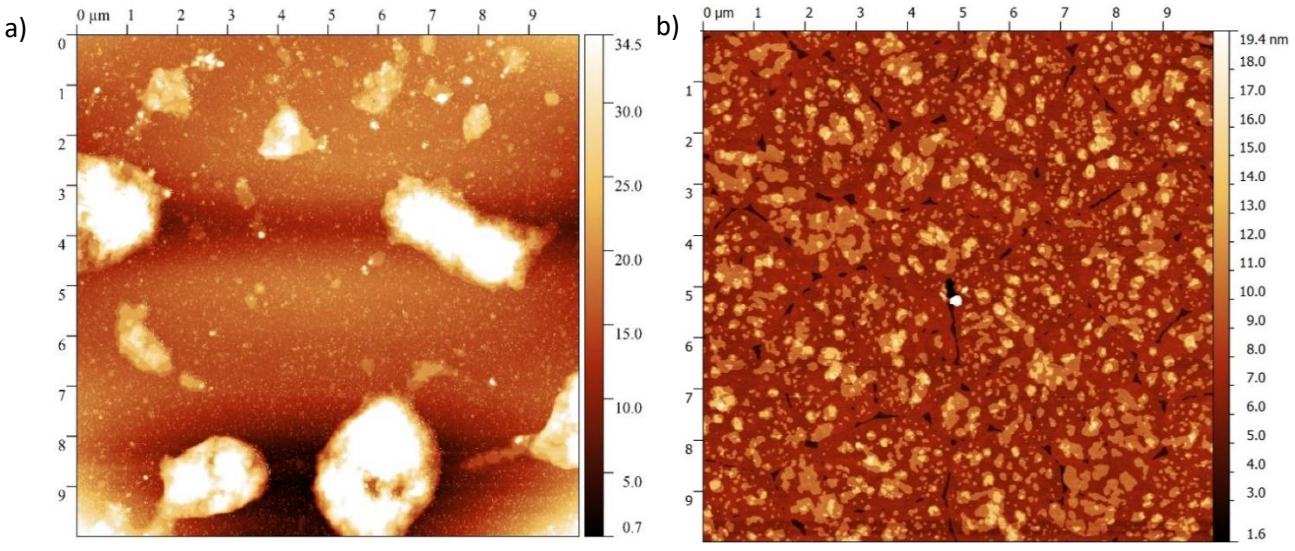


Figure S2. AFM images of **D2-Und-BTBT-Hex** films prepared by spin-coating technique on (a) bare silica substrate (b) silica substrate modified by octyldimethylclorosilane (ODMS).

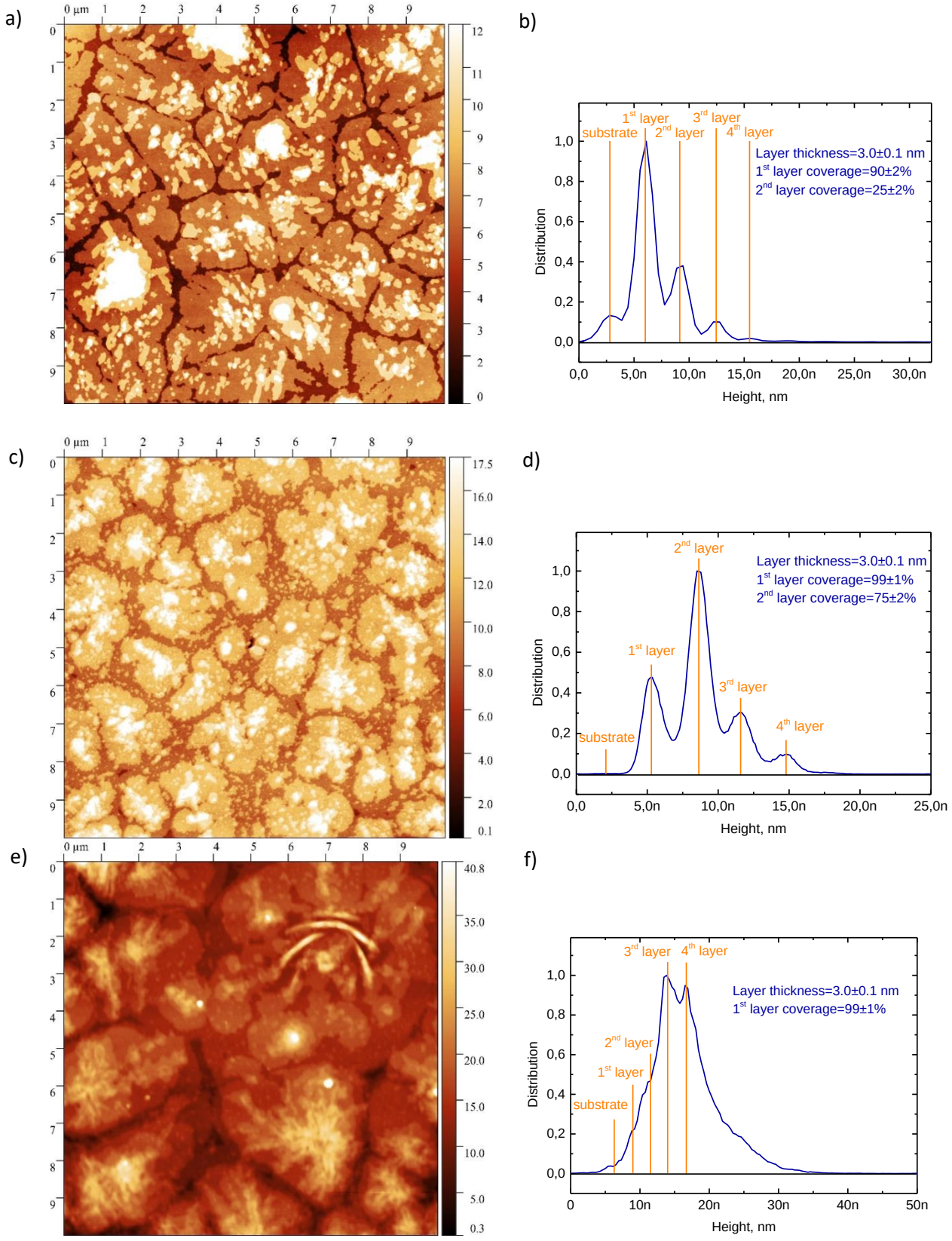


Figure S3. AFM images and height distributions of **D2-Und-BTBT-Hex** films prepared by spin-coating technique at optimal spinning rates from the solutions with concentration of (a, b) 1 g/L, (c, d) 1.4 g/L, (e, f) 2 g/L.

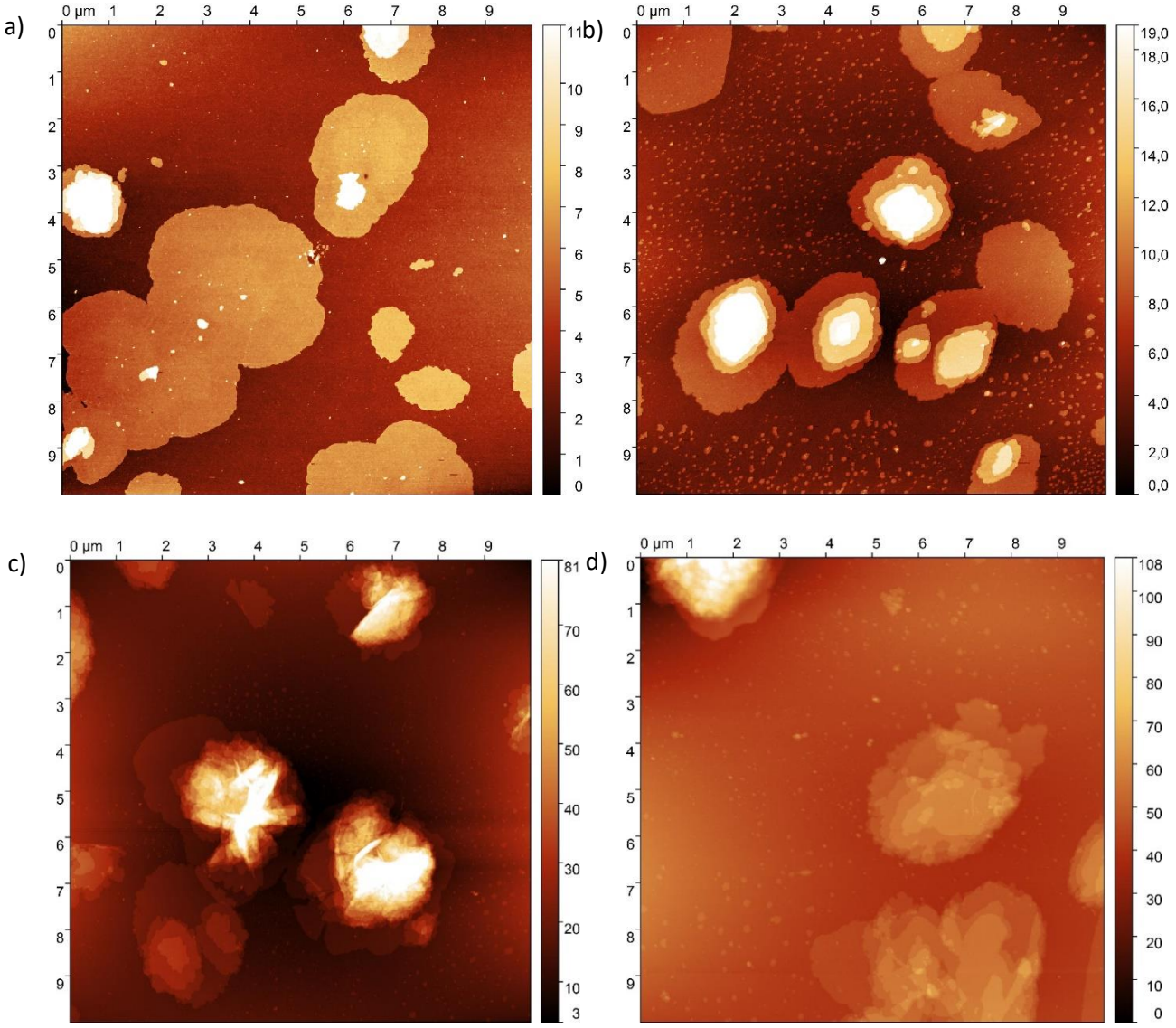


Figure S4. AFM images of **D2-Und-4T-Hex** structures obtained by spin-coating technique from solutions with concentration of (a) 0.2 g/L, (b) 0.4 g/L, (c) 0.8 g/L, (d) 1 g/L.

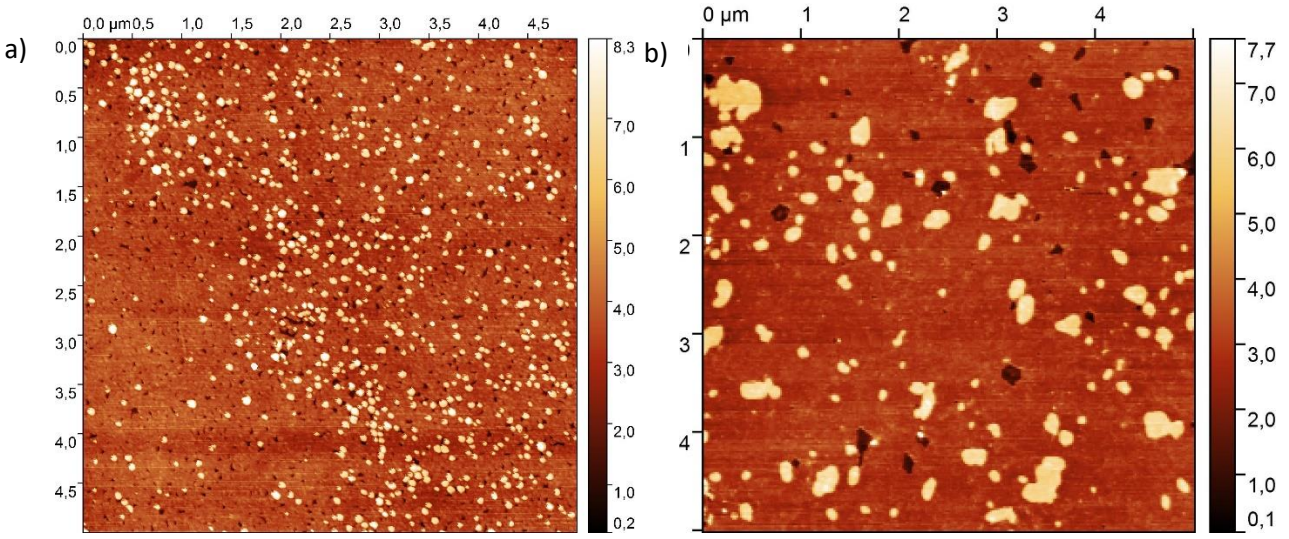


Figure S5. AFM image of LB BTBT dimer films before (a) and after (b) solvent vapor annealing

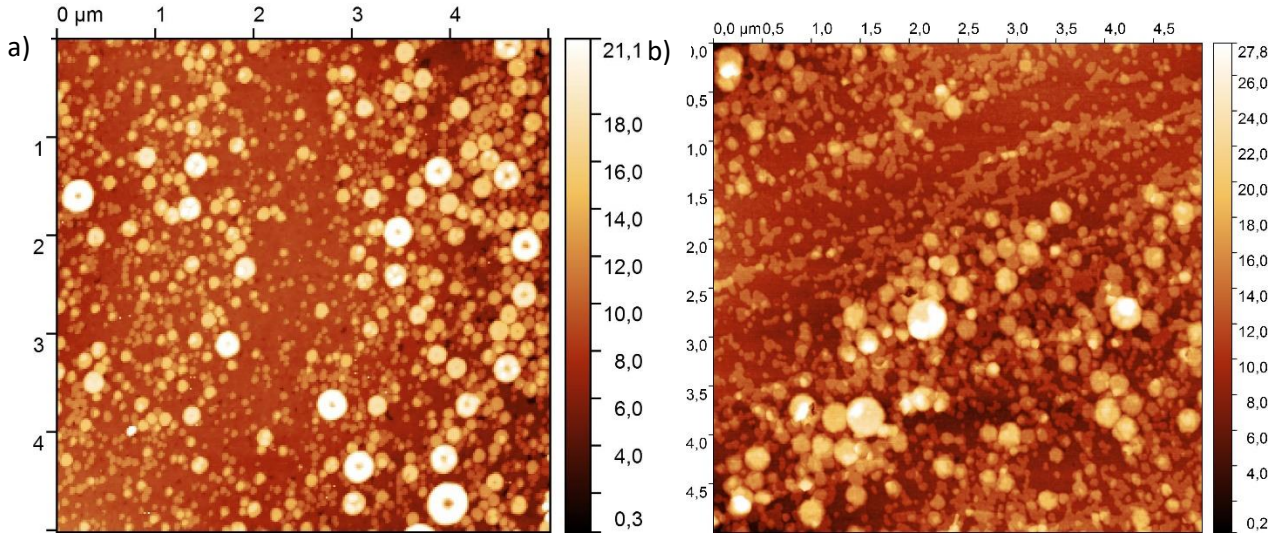


Figure S6. AFM images of LB films prepared from **D2-Und-BTBT-Hex** at concentrations of (a) 0.5 g/L, (b) 1 g/L

## 2. X-ray investigations

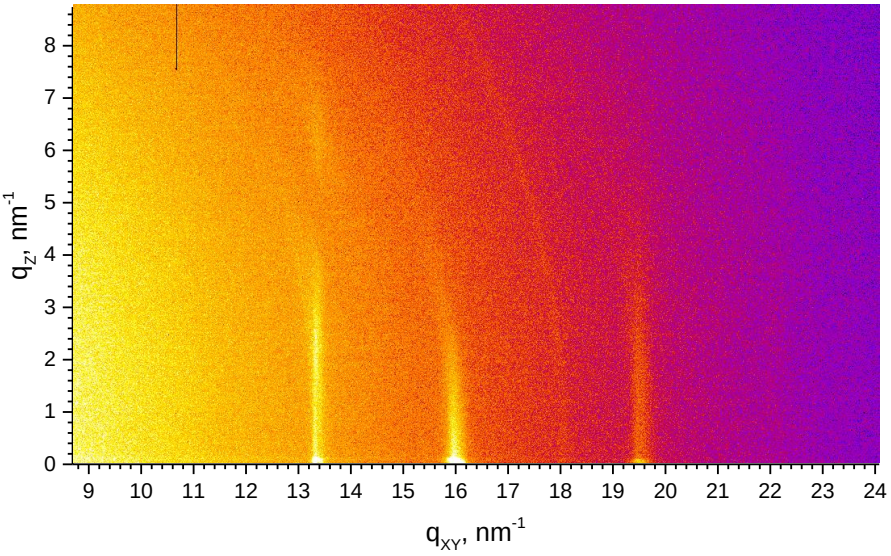


Figure S7. Grazing incidence diffraction pattern for spin-coated monolayer film **D2-Und-BTBT-Hex**.

## 3. Electrical measurements

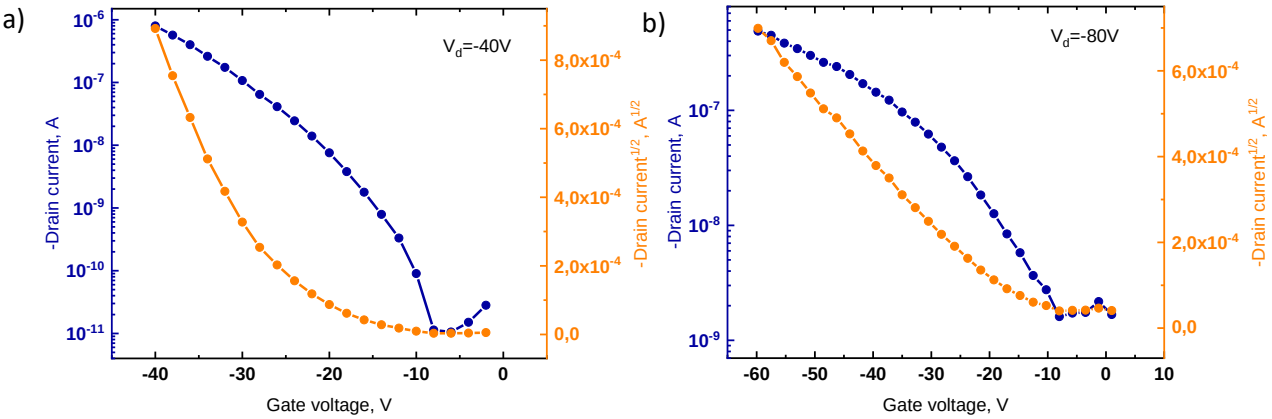


Figure S8. Typical transfer characteristics for (a)SC and (b) LB monolayer OFETs based on **D2-Und-BTBT-Hex**.

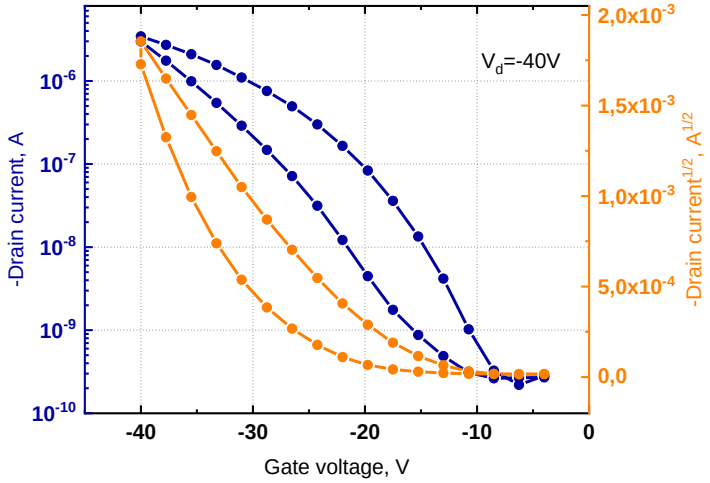


Figure S9. Typical transfer characteristics hysteresis loop of monolayer OFETs based on monolayer LS film of **D2-Und-BTBT-Hex.** Transfer curves hysteresis loop for OFETs fabricated by LB or SC techniques are somewhat the same.

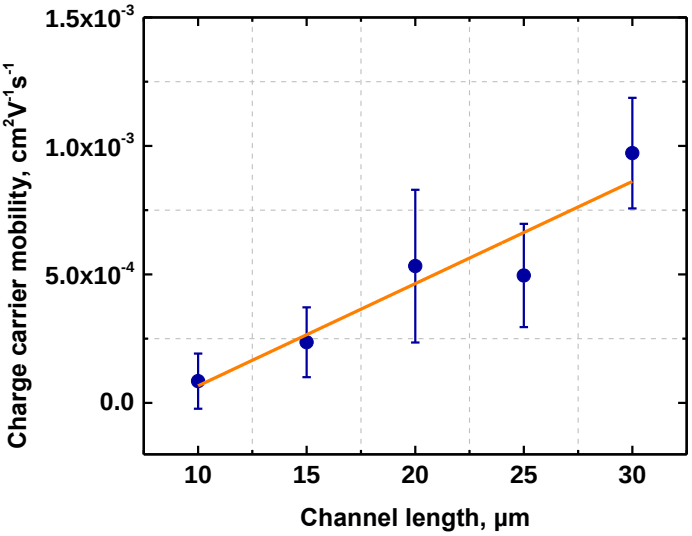


Figure S10. Charge carrier mobility dependence of LS film of **D2-Und-BTBT-Hex** from the channel length.

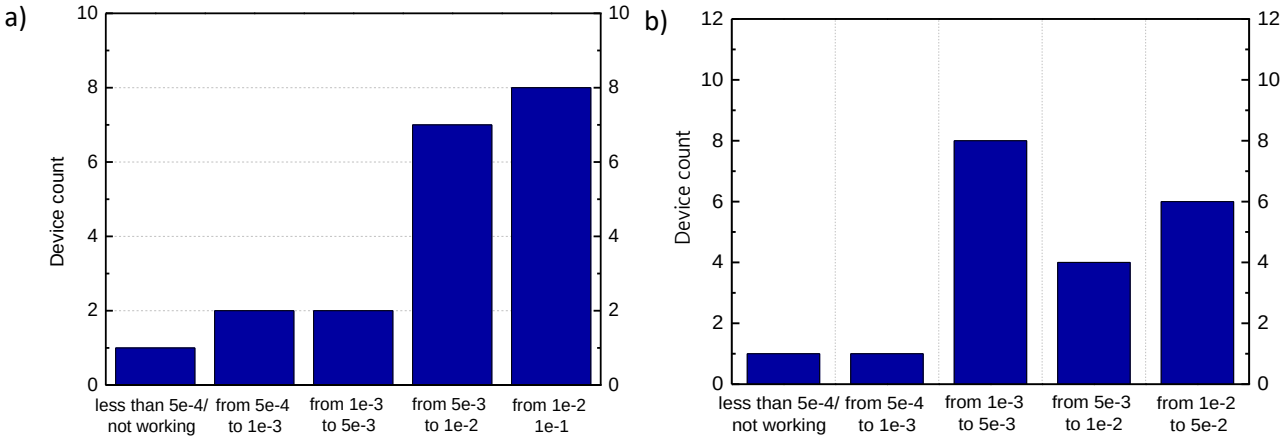


Figure S11. Mobility distribution for twenty (a) LS and (b) SC monolayer OFETs based on BTBT dimer.

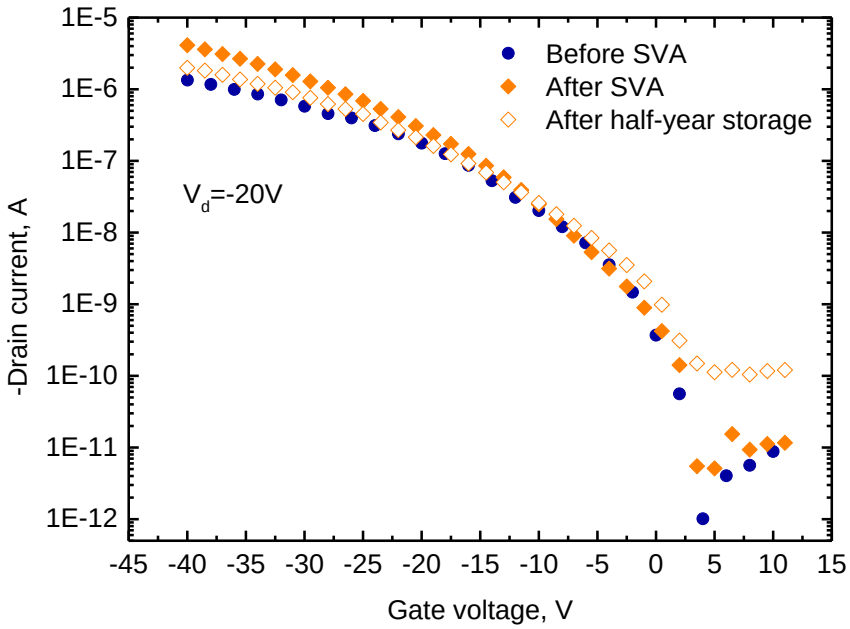


Figure S12. Transfer characteristics of spin-coated OFETs as prepared (dark blue), after SVA post-treatment (filled orange) and after a half-year storage (unfilled orange).