

Figure S1. AFM images of MDBS nanowires formed by spin-coating at different temperatures.

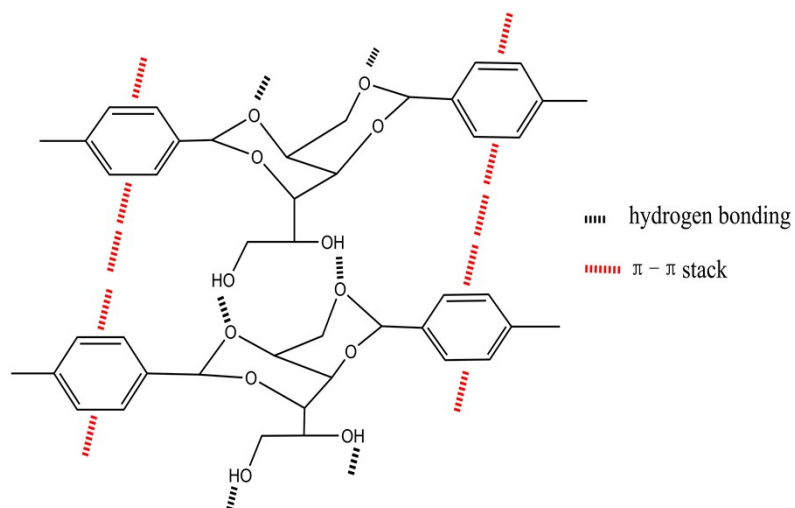


Figure S2. Schematic illustration of intermolecular hydrogen bonding in the sorbitol groups and π - π stack between benzene rings of MDBS in nanowire structures.

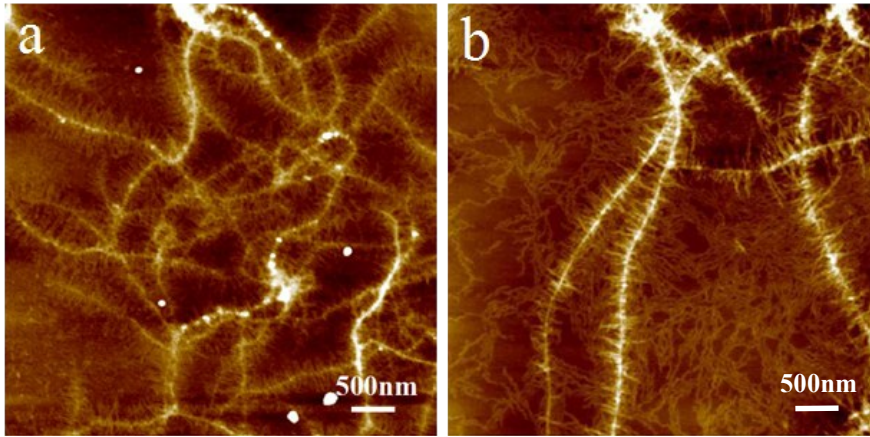


Figure S3. AFM images of films spin-coated from different solvents on silicon wafers:
(a) CB and (b) TCB.

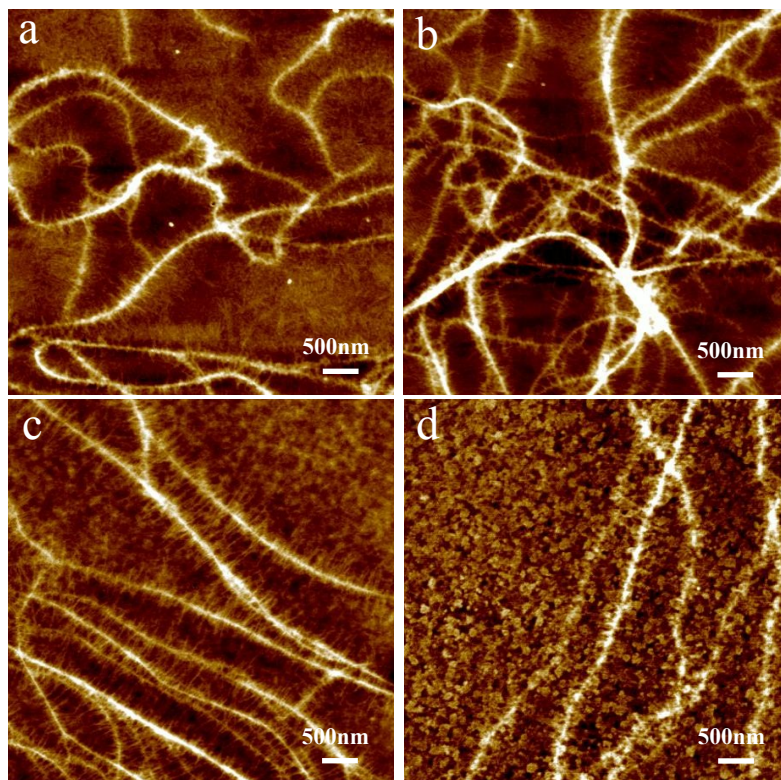


Figure S4. AFM images of films spin-coated from ODCB on the different substrates: (a) carbon film, (b) mica, (c) PEDOT:PSS and (d) indium tin oxide (ITO)-coated glass substrate.

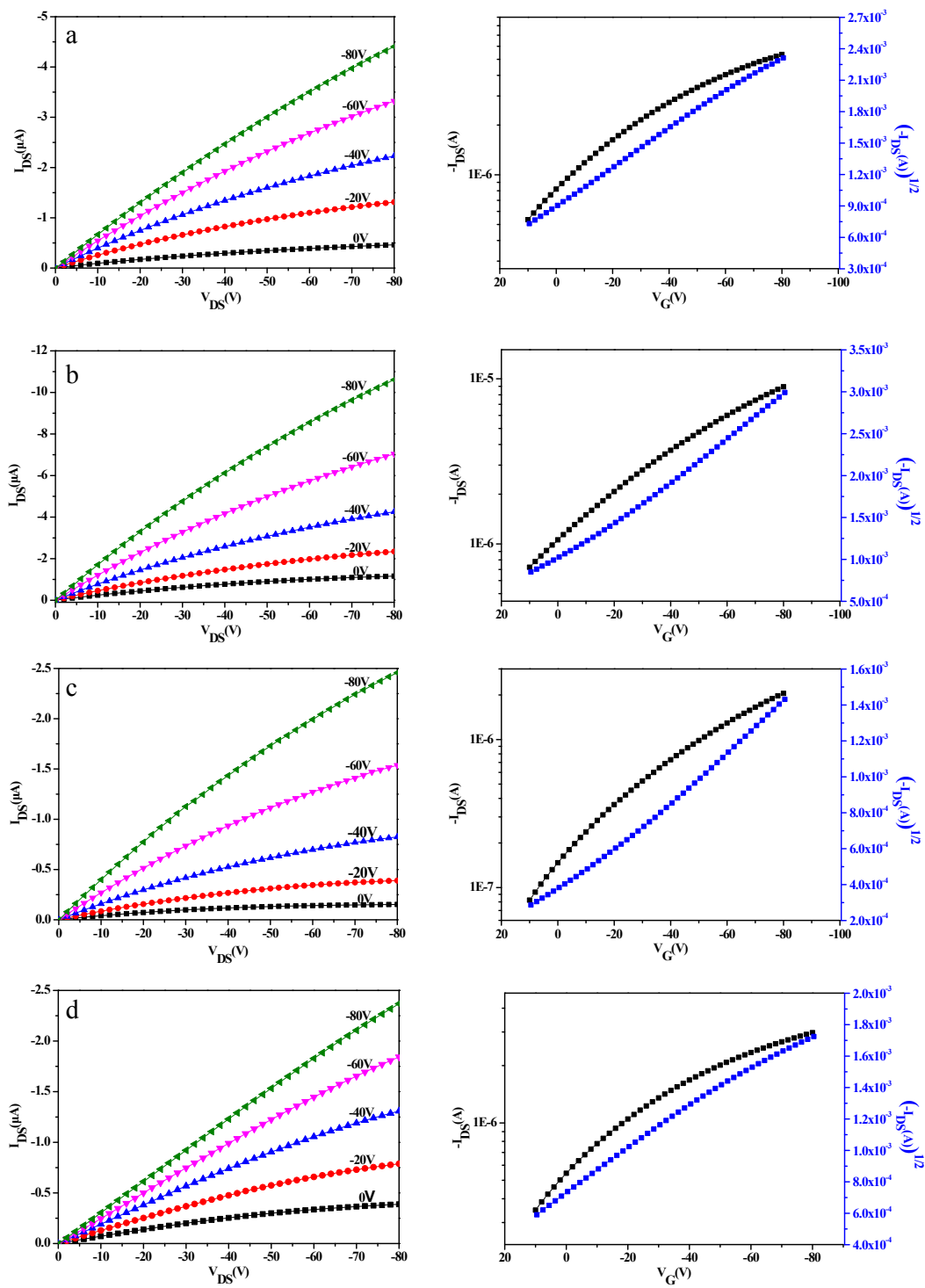


Figure S5. Current-voltage characteristics and transfer curve of the P3HT/MDBS OFET devices spin-coated at (a) 70 °C, (b) 100 °C, (c) 110 °C and (d) 130 °C.

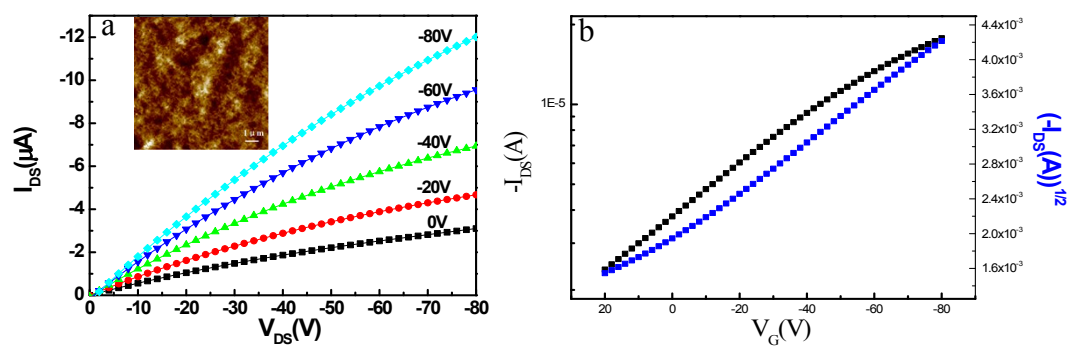


Figure S6. (a) Current-voltage characteristics and (b) transfer curve of the solvent vapor annealed P3HT OFET device. The insets in (a) is the AFM image of the P3HT film.

Bulk heterojunction (BHJ) solar cells.

An indium tin oxide (ITO)-coated glass substrate was washed with detergent and cleaned in an ultrasonic bath for 25 min sequentially using deionized water, acetone and isopropyl alcohol. Subsequently, the cleaned ITO substrates were treated with H₂O₂:NH₃:H₂O (1:1:5 v/v) mixed solvent at 160 °C for 40 min. PEDOT:PSS was filtered through a PVDF filter and spin-coated on the ITO glass, producing a film with a thickness of 35 nm. After baking the PEDOT:PSS films at 130 °C for 20 min, the photovoltaic layer blend solution was spin-coated on PEDOT:PSS at 90 °C. The P3HT/PCBM films with and without MDBS were dried under vacuum for more than 5 h before depositing the top electrodes. The top electrode consisted of a lithium fluoride (LiF) layer (0.6 nm) followed by a 100 nm layer of aluminum (Al); both layers were deposited by thermal evaporation using a shadow mask at 10⁻⁶ Torr. The effective area of an OPV cell was 0.04 cm². Current density-voltage (*J-V*) characterization of the OPV cells was conducted on a computer-controlled Keithley 236 Source Measure Unit at 20 °C. An AM 1.5G AAA class solar simulator (model XES-301S, SAN-EI) with an intensity of 100 mWcm⁻² was used as the white light source. The light intensity was calibrated with a standard single-crystal Si photovoltaic cell.

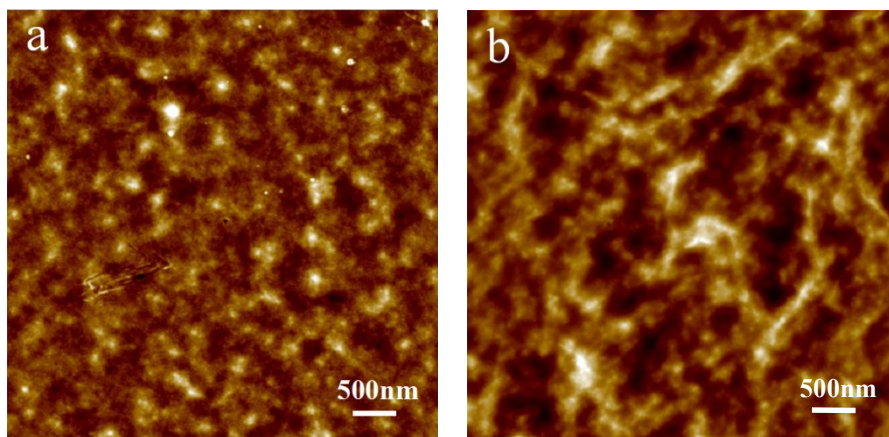


Figure S7. AFM images of spin-coated (a) P3HT/PCBM, (b) P3HT/PCBM/MDBS (MDBS is 2.0 wt%) films with blend solution concentration of 10.0 mg/mL .

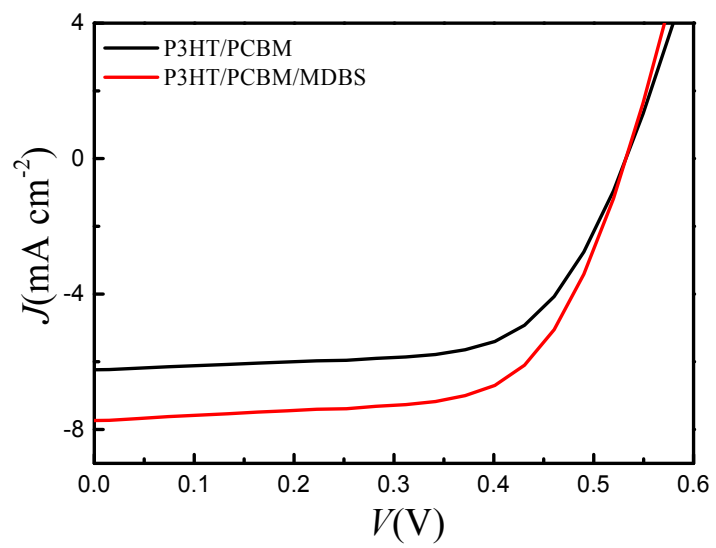


Figure S8. Current density-voltage curves of P3HT/PCBM and P3HT/PCBM/MDBS bulk heterojunction solar cells.

Table S1. Performance parameters of P3HT/PCBM BHJ OPV devices with and without MDBS.

device	V_{oc} (V)	J_{sc} (mA/cm²)	FF (%)	PCE (%)
P3HT/PCBM	0.53	6.27	65.6	2.20
P3HT/PCBM/MDBS	0.53	6.86	66.1	2.40