Electronic Supplementary Material (ESI) for RSC Advances.

Heavily N-doped monolayer graphene electrodes used for high-performance N-channel polymeric thin film transistors

Guoqing Zhou, Guoxing Pan, Linzhi Wei, Tian Li and Fapei Zhang*

High Magnetic Field Laboratory, Chinese Academy of Science, Hefei 230031, P. R. China

*Address correspondence to fzhang@hmfl.ac.cn

a)

element	weight ratio	atomic ratio
C	6.30	11.56
Si	24.98	34.45
O	68.73	53.99
total	100	

b)

element	weight ratio	atomic ratio
C	4.85	8.97
Si	26.8	37.2
O	68	53.77
Cs	0.34	0.06
total	100	

Table S1. Element contents for pristine graphene (a) and the Cs_2CO_3- doped graphene surface (b) estimated from energy dispersive spectroscopy (EDS) measurements.

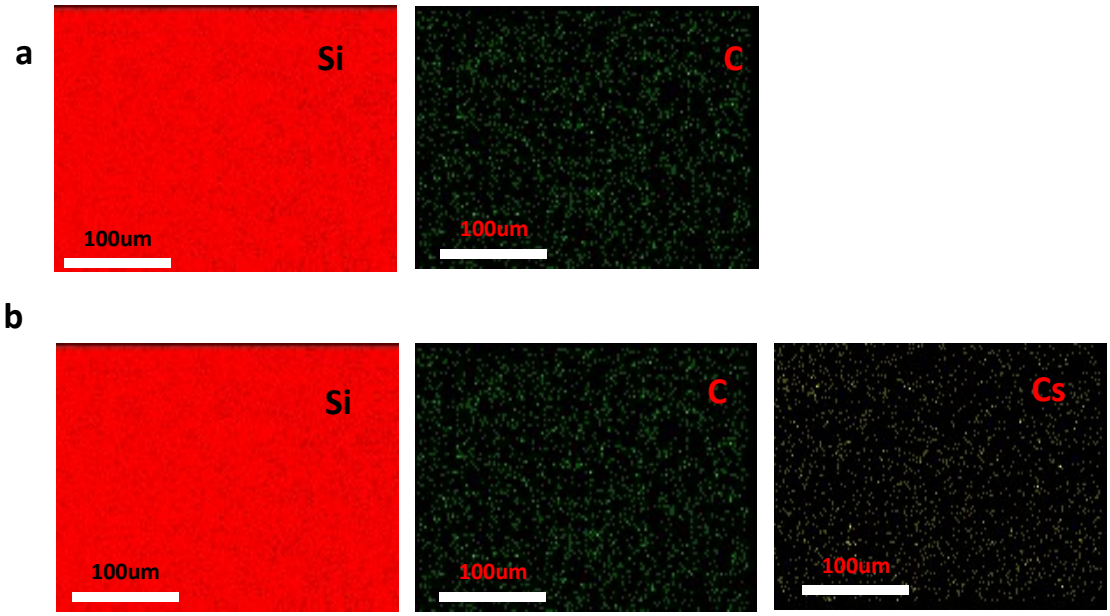

Figure S1 EDS elemental mapping for pristine graphene (a) and the Cs_2CO_3- doped graphene surface (b).

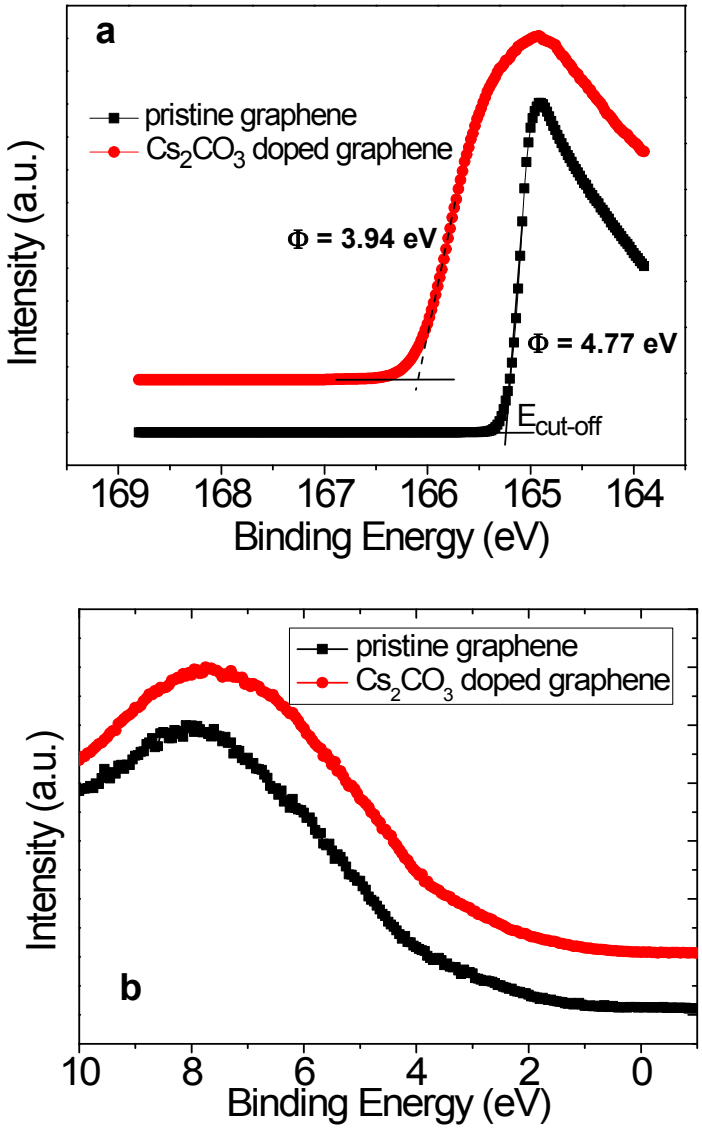

Figure S2 UPS spectra near the secondary electron cut-off region (a) and near the onset region (b) obtained from pristine graphene and the Cs_2CO_3 doped graphene, respectively. The value of work function (Φ) is determined via the relation $\Phi = h\upsilon - E_{cut\text{-}off}$, where hυ is the photon energy of synchrotron light source (170 eV) and E_{cutoff} is the binding energy of secondary electron cut-off.

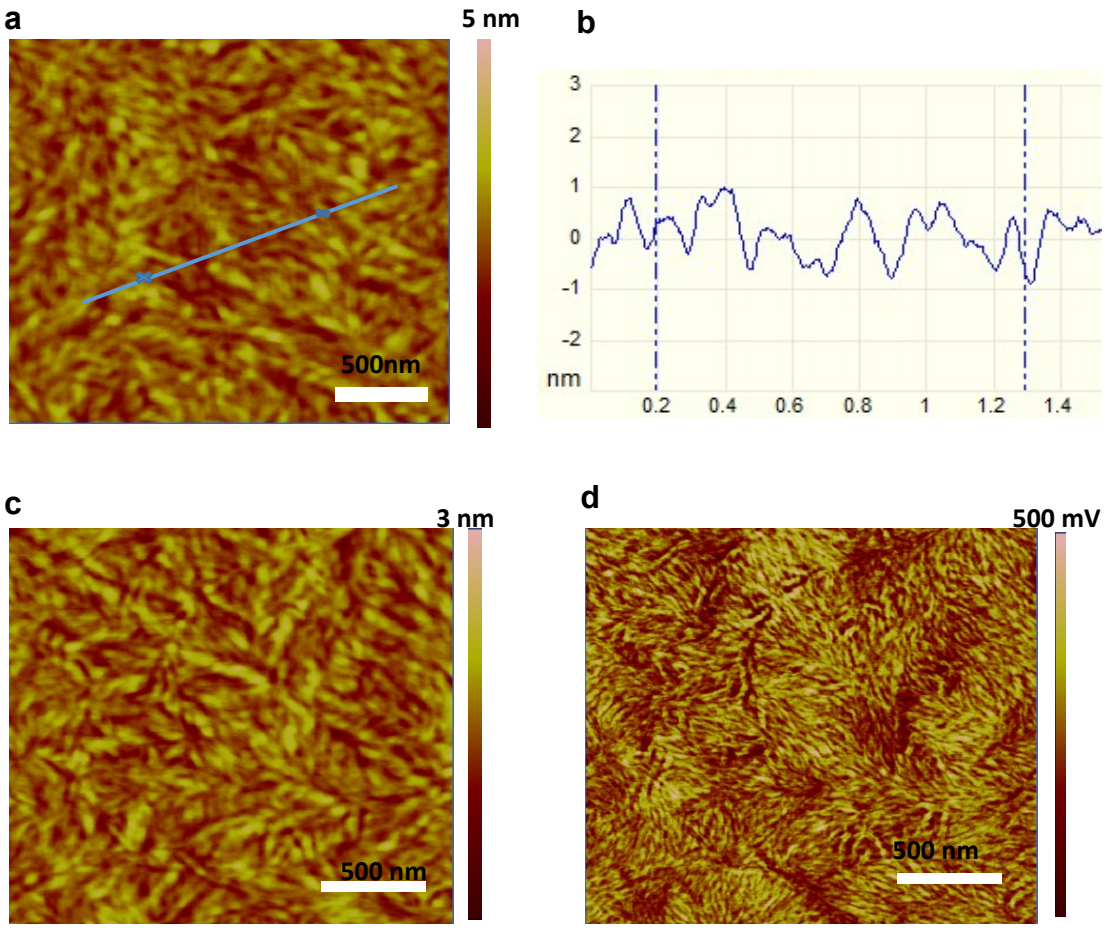

Figure S3 (a) AFM height image and (b) the profile of a highlighted line for the annealed P(NDI2OD-T2) film spin-coated on pristine graphene; (c) AFM height and (d) phase image for the annealed P(NDI2OD-T2) film spin-coated on the SiO_2/Si substrate, respectively.

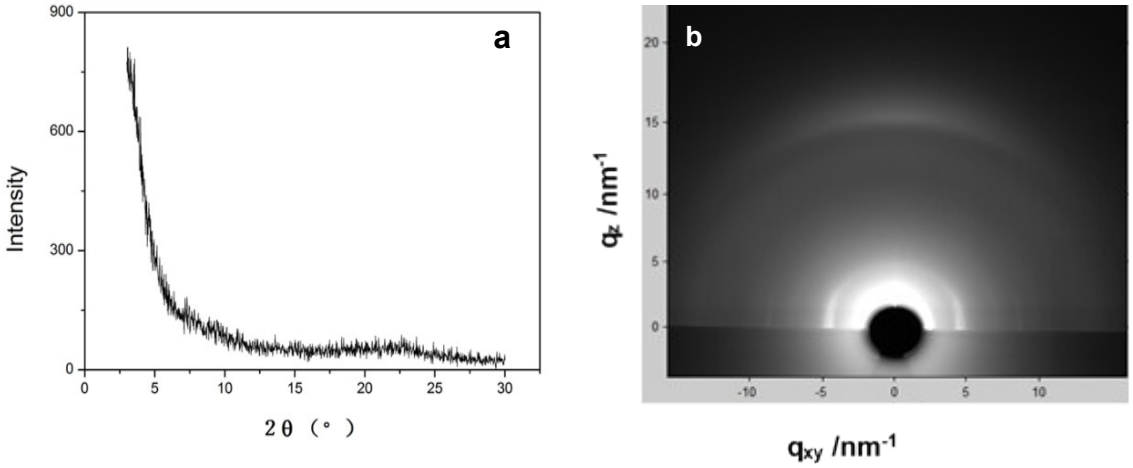

Figure S4 (a) Specular scan X-ray diffraction (XRD) pattern and (b) synchrotron-based 2D grazing incidence X-ray diffraction (GIXRD) pattern of the P(NDI2OD-T2) film deposited on the Cs_2CO_3 doped graphene sheet (transferred on the SiO_2/Si substrate). The sample was annealed at 110 °C for 4 h in the nitrogen atmosphere. The incidence angle of X-ray in the GIXRD experiment is 0.20°

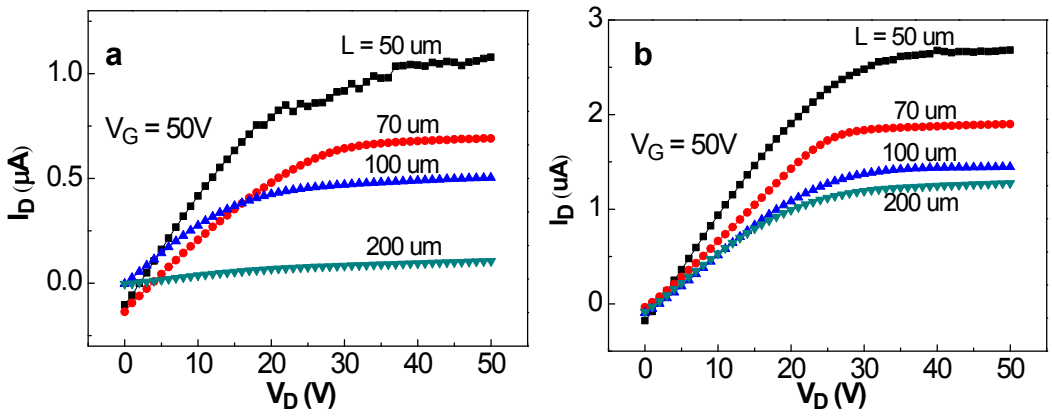

Figure S5. Channel length dependence of the output curves (I_D-V_D) at a gate voltage of 50V for the OFETs of P(NDI2OD-T2) using pristine graphene (a) and the Cs_2CO_3-doped graphene (b) as the S/D electrodes.