

## **Supplementary Information**

### **Solution-Processed Donor-Acceptor Polymer Nanowire Network Semiconductors for High-Performance Field-Effect Transistors**

Yanlian Lei<sup>1</sup>, Ping Deng<sup>2</sup>, Jun Li<sup>3</sup>, Ming Lin<sup>3</sup>, Furong Zhu<sup>1</sup>, Tsz-Wai Ng<sup>4</sup>, Chun-Sing Lee<sup>4</sup>, & Beng S. Ong<sup>2,5</sup>

<sup>1</sup> Department of Physics and Institute of Advanced Materials, Hong Kong Baptist University, Hong Kong SAR, P. R. China.

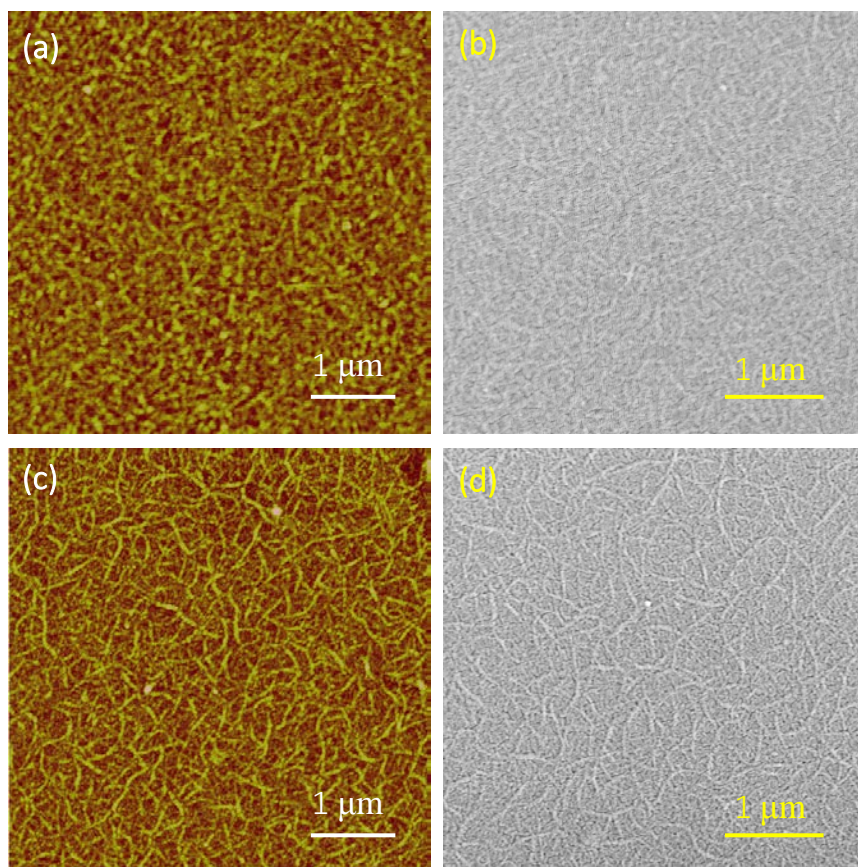
<sup>2</sup> Research Centre of Excellence, Institute of Creativity and Department of Chemistry, Hong Kong Baptist University, Hong Kong SAR, P. R. China.

<sup>3</sup> Institute of Materials Research and Engineering, Agency for Science, Technology and Research, Singapore 117602

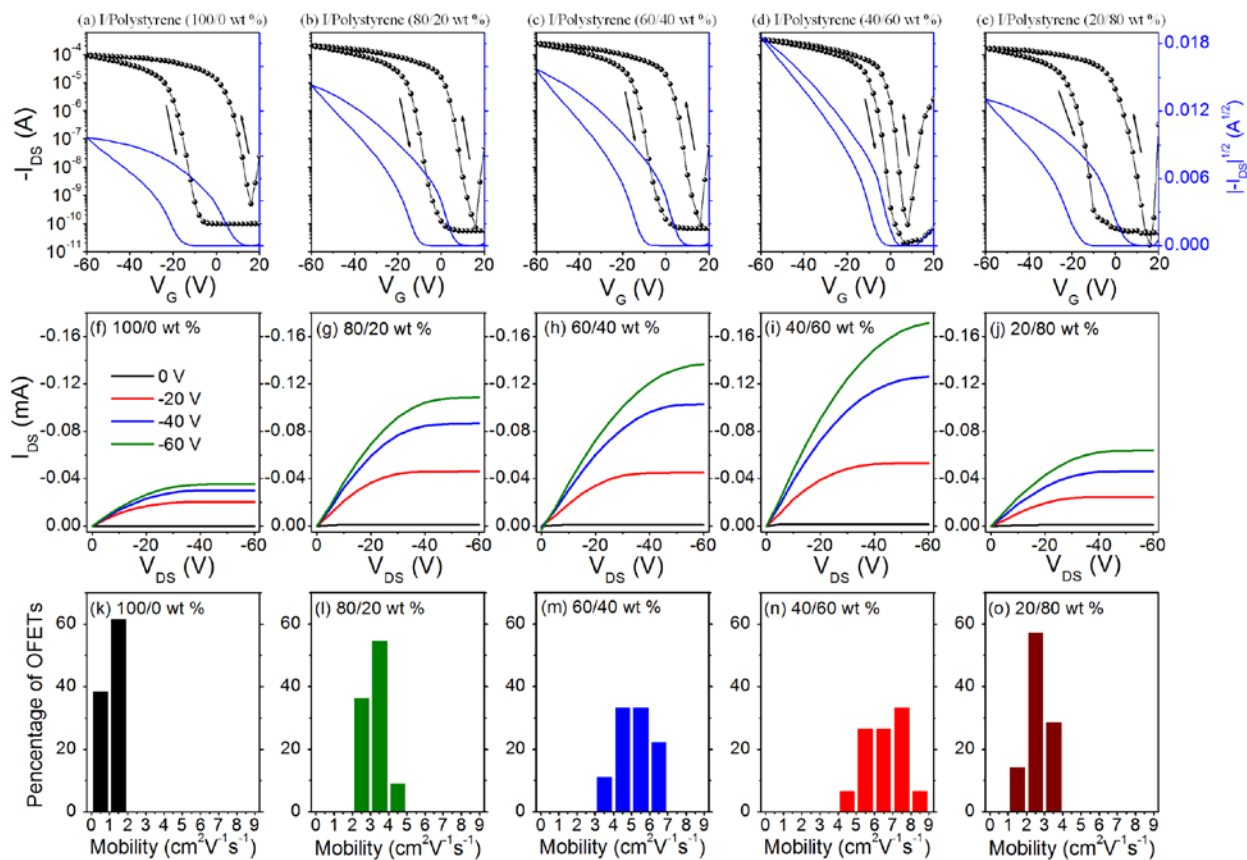
<sup>4</sup> Center of Super-Diamond and Advanced Films, Department of Physics and Materials Science, City University of Hong Kong, Hong Kong SAR, P. R. China.

<sup>5</sup> Department of Materials Science and Engineering, South University of Science and Technology of China, Shenzhen, Guangdong, P.R. China.

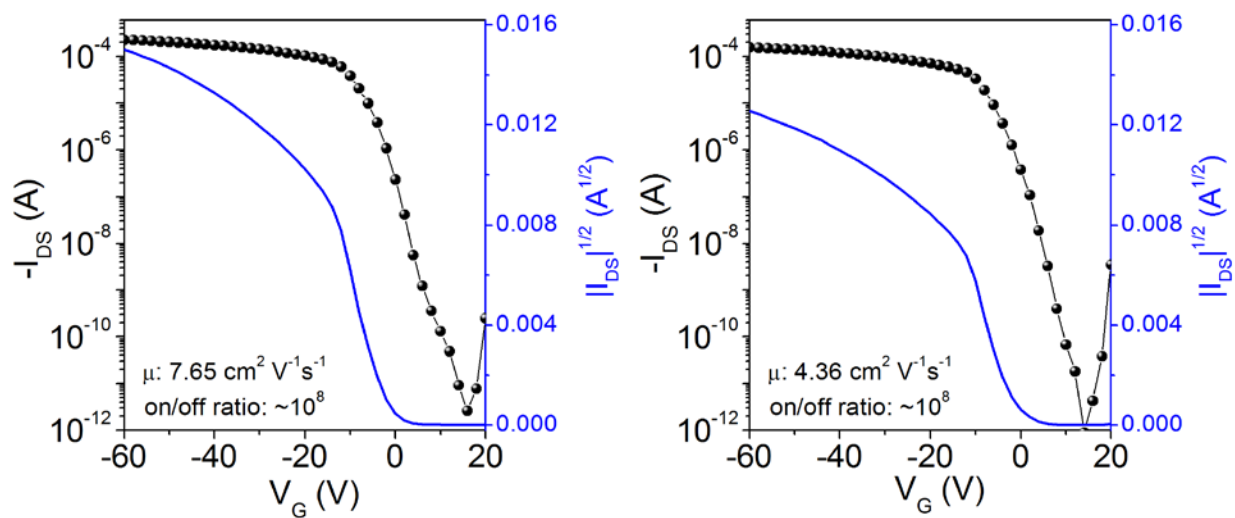
Correspondence and requests for materials should be addressed to B.S.O. (email: [bong@hkbu.edu.hk](mailto:bong@hkbu.edu.hk)) or to F.R.Z. (email: [frzhu@hkbu.edu.hk](mailto:frzhu@hkbu.edu.hk))



**Figure S1.** AFM and SEM images of nanowire networks of (I) from (I)/polystyrene (40/60 wt %) films. (a) and (b) are AFM (topography) and SEM images of defused nanowire-like features of (I) from (I)/polystyrene film thermally annealed after polystyrene removal; (c) and (d) are AFM (topography, same as Figure 2f) and SEM images of well-defined nanowire network of (I) from thermally annealed (I)/polystyrene film with the polystyrene removed after thermal treatment.



**Figure S2.** Field-effect properties of OFETs with (I) and (I)/polystyrene channel semiconductors. Typical transfer characteristics of OFETs with (a) neat (I), and (b)-(e) (I)/polystyrene channel semiconductors with various polystyrene loadings; typical output curves of OFETs with (f) neat (I), and (g)-(j) (I)/polystyrene channel semiconductors with various polystyrene loadings; Mobility distributions of OFETs with (k) neat (I), and (l)-(o) (I)/polystyrene channel semiconductors with various polystyrene loadings.



**Figure S3.** Field-effect transistor performances based on annealed films with polystyrene removal. (a) Annealed with polystyrene; (b) annealed without polystyrene.