Separated Carbon Nanotube Macroelectronics for Active Matrix Organic Light-Emitting Diode Displays

Jialu Zhang[†,§], Yue Fu[†,§], Chuan Wang[†,§], Po-Chiang Chen[§], Zhiwei Liu[‡], Wei Wei[‡], Chao Wu[‡], Mark E. Thompson[‡], and Chongwu Zhou*[,§]

[§]Department of Electrical Engineering and [‡]Department of Chemistry, University of Southern California, Los Angeles, California 90089, United States

* Corresponding author: chongwuz@usc.edu.

[†] These authors contributed equally to this work.

Supporting Information

1. AFM image of the APTES coated SiO_2 surface

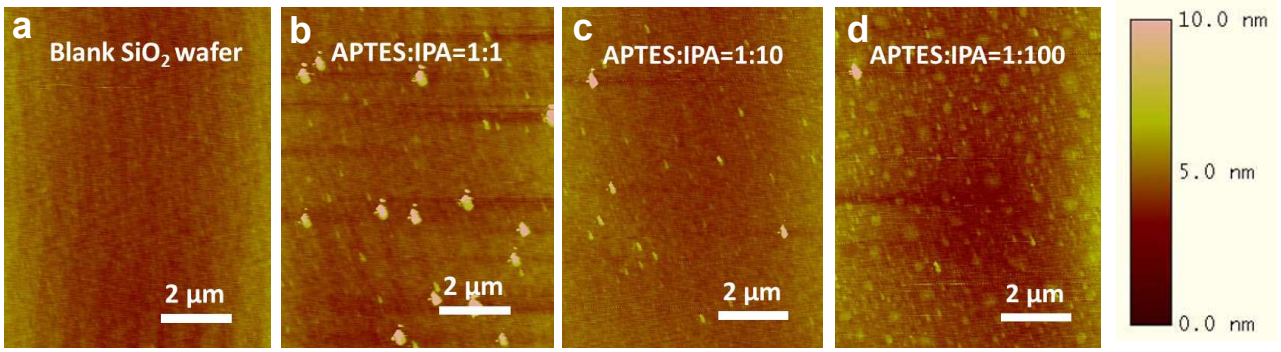

Figure S1. AFM image of SiO_2 surface coated with APTES solution with different concentration. (a) Blank SiO_2 surface. (b-d) SiO_2 surface functionalized with solution of APTES and IPA volume ratio of 1:1, 1:10 and 1:100, respectively. From the images, one can find that the SiO_2 surface in Figure S1b has many impurities, while the one in Figure S1d shows that APTES did not cover the whole surface.

2. Separated nanotube thin-film on Al_2O_3 and Al_2O_3/SiO_2 film

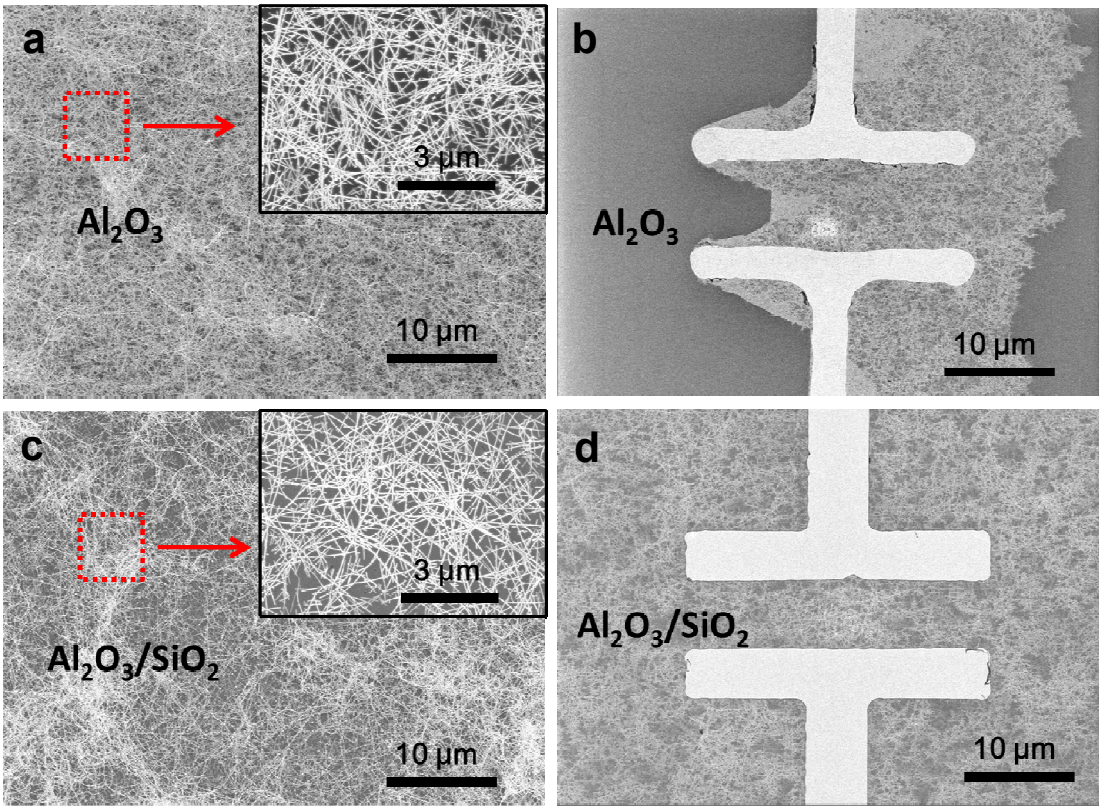

Figure S2. (a,c) SEM images of the separated nanotube thin-films deposited on Al_2O_3 and Al_2O_3/SiO_2 surface, respectively (b,d) SEM images for the same samples after one step of photolithography. Nanotubes on the Al_2O_3 sample would peel off while the ones on Al_2O_3/SiO_2 bilayer dielectric still stick to the surface.

3. Two terminal measurement of the OLED

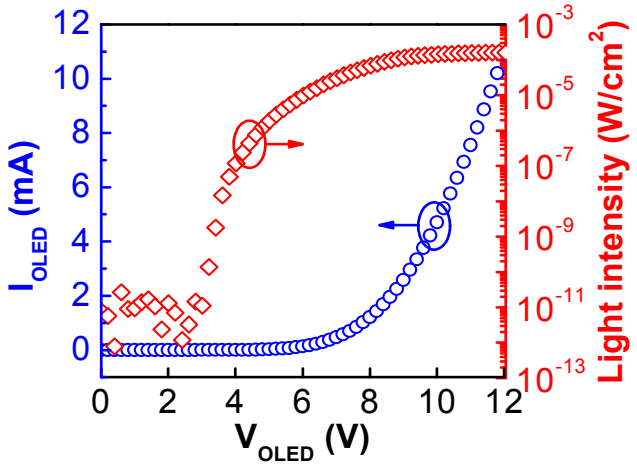

Figure S3. Two terminal measurement of the OLED showing the current through the OLED (I_{OLED}) (red line) and OLED light intensity (green line) versus the voltage applied across the OLED (V_{OLED}).