Supplementary Information for

Fabrication of Ordered Bulk Heterojunction Organic Photovoltaic Cells using Nanopatterning and Electrohydrodynamic Spray Deposition Methods

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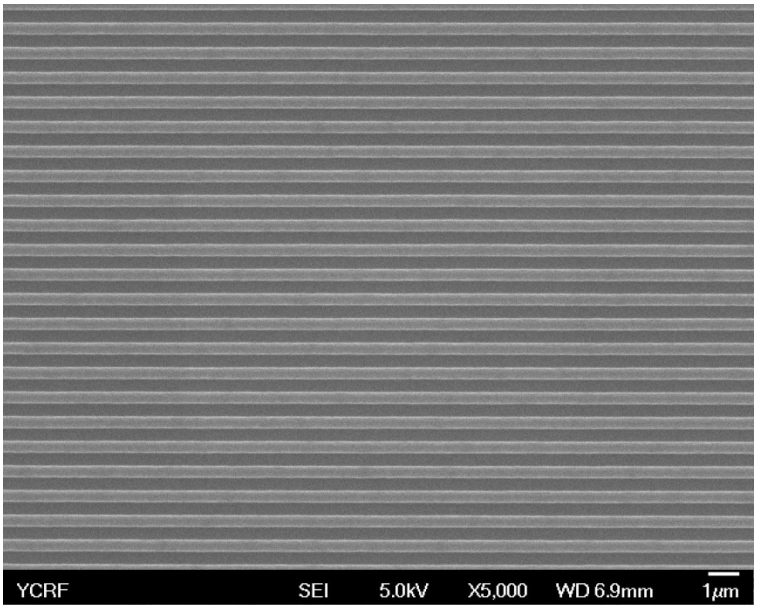
Preparation of PDMS nanostamp: Without any chemical pretreatment, successful nano-patterns were obtained as shown in the figure below. The PDMS stamp was in contact with the P3HT layer with light weight of 5 kg. The PDMS stamp was kept for short duration below 5 min at low temperature of 60 °C and then released from the contact. This process did not cause any defect of the P3HT layer.



<SEM image of large scale area of nanoimprinted P3HT layer>

Detailed process for preparation of PDMS stamp is as below.

PDMS and curing agent (Sylgard) were mixed with 10:1 (mass) ratio and poured over photoresist line patterned silicon wafer nanotemplate (29 mm×24.2 mm, period: 606 nm, groove depth: 190 nm; SNSC16.5- 2924-190-P, LightSmyth Technologies Inc., USA) which has the periodic pattern size. After curing by baking at 100 °C for 30 min, the PDMS stamp was removed from the master and cut into pieces of desired size (2.4 cm×2.4 cm). To reduce the amount of unreacted PDMS oligomers in the stamp, it was washed with fresh ethanol.

After this treatment, the PDMS stamp was dried at 90 °C for 2 hours to remove any trace of ethanol prior to use.