

ADVANCED FUNCTIONAL MATERIALS

Supporting Information

for

Advanced Functional Materials, adfm.200600183

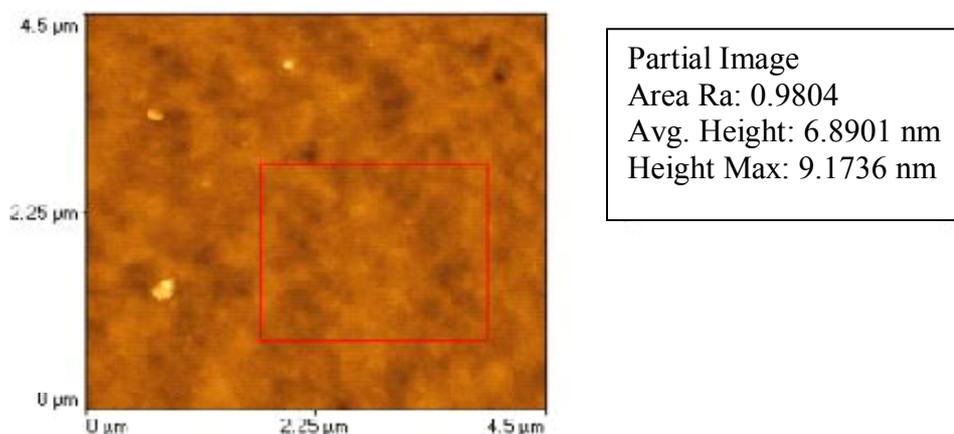
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Supplementary Information

Efficient Bulk Heterojunction Photovoltaic Cell based on Energy Transfer in Graded Band-gap Polymers

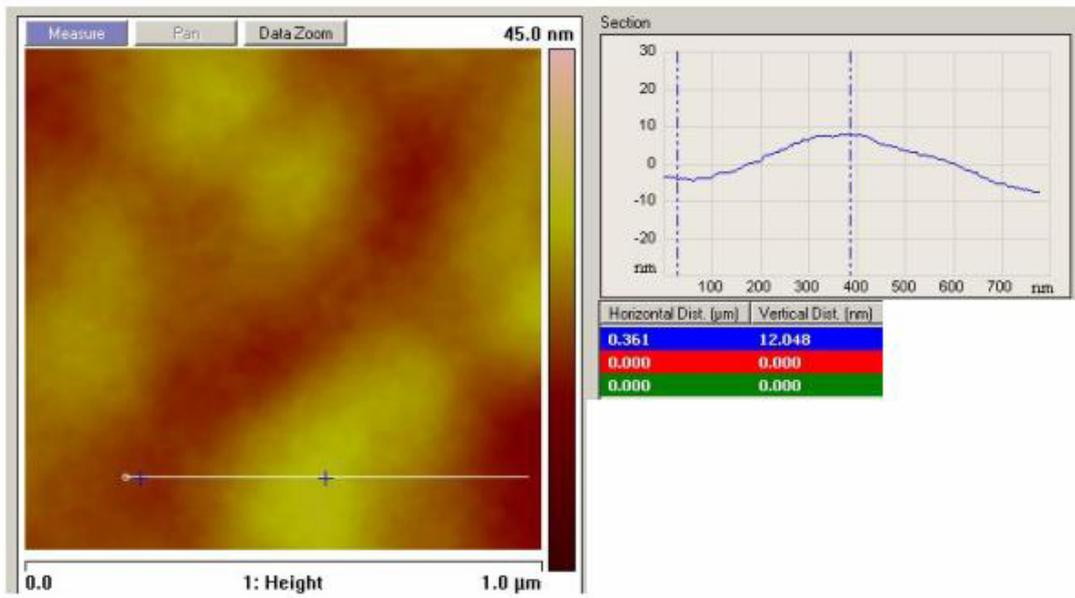
Dhritiman Gupta^a, Dinesh Kabra^a, Nagesh Kolishetti^b,
S. Ramakrishnan^b, K.S. Narayan^{a*}

AFM topography image of the ternary blend polymer film. The RMS roughness of the partial image is ~ 1 nm and the average height variation is < 7 nm.



Experimental Detail of the Photocurrent Imaging:

As mentioned in the text, the spatial scans for the photocurrent were done in the wide-field regime (without z-axis feedback control) and not in the near-field regime. The 100X micro-objective lens (with high numerical aperture of 0.95 and working distance ~ 0.3 mm) was at a fixed distance from the device which was kept on a scanner head (data was taken at a step size of 100 nm) and the beam diameter was in the range of $0.5 \mu\text{m}$ (for $\lambda \sim 530$ nm) and $0.4 \mu\text{m}$ (for $\lambda \sim 405$ nm) (spot size $\sim 0.88 \times [\lambda/\text{NA}]$ for the Gaussian intensity profile of the beam). Devices which did not show significant height variation from AFM observations were used for these experiments. Initial scan was performed on a $10 \mu\text{m} \times 10 \mu\text{m}$ window. The images were found to be homogeneous throughout the scanned region. We scanned $5 \mu\text{m} \times 5 \mu\text{m}$ area with higher resolution from these images as shown in text. Image processing software was used to calculate area of different phases and plotted in form of histograms. Controlled large-height variations resulting from phase-separation over macro length scales are observed in films obtained upon addition of controlled amount of non-solvents (K. Nagesh, D. Kabra, K. S. Narayan, S. Ramakrishnan, *Syn. Met.* 2005, 155, 295). In the present case of microphase separation, fairly low level of height variations is present (see accompanying image). Our technique of measuring from relatively large distance (compared to the height variation) ensures that current variation does not arise from topographical features alone.



2D profile along the domains