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## Supplementary Information

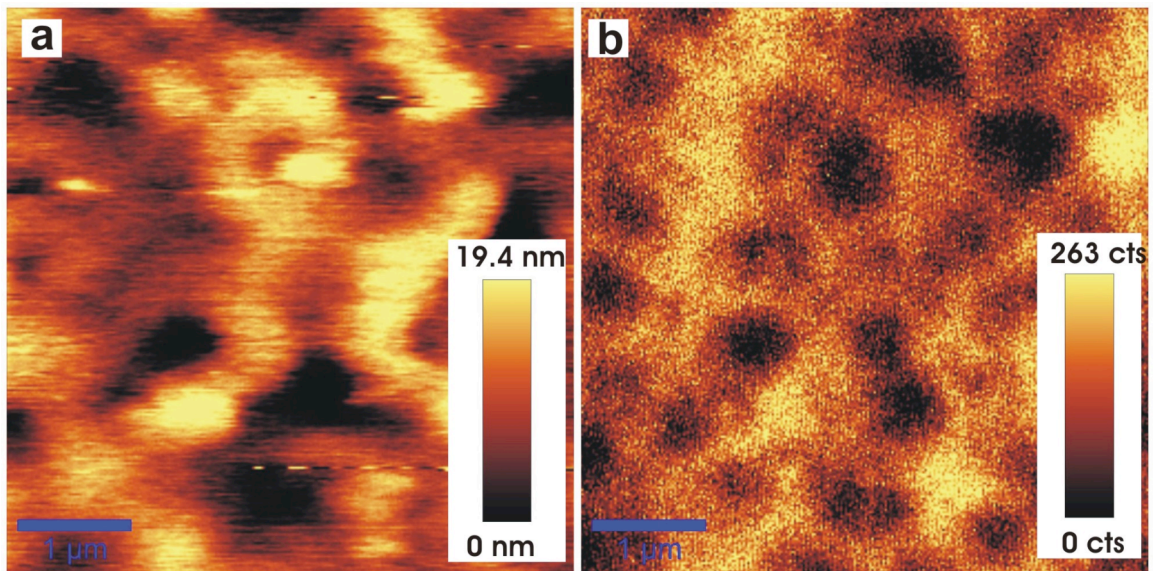
# Organic non-volatile memories from ferroelectric phase separated blends

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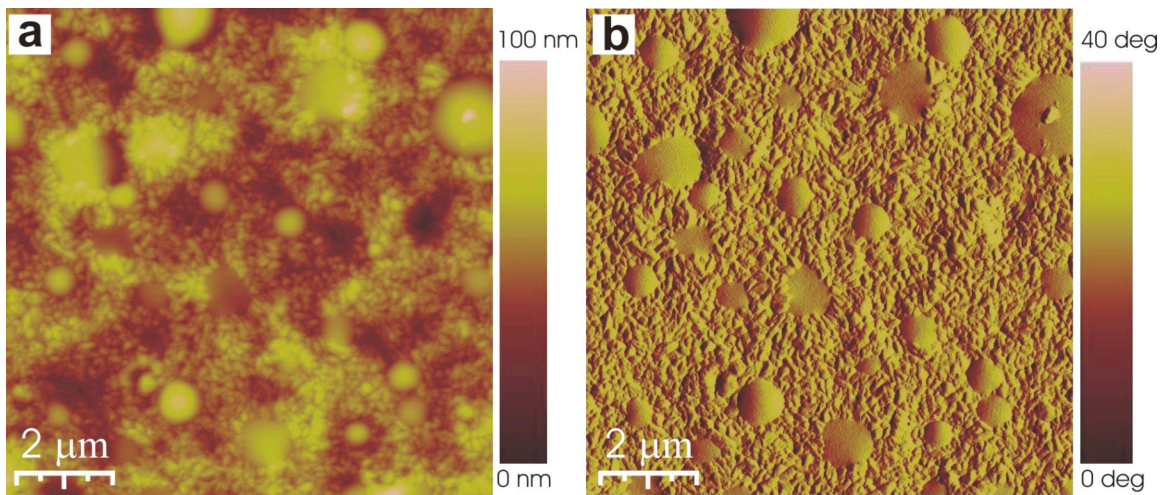
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The morphology of the bulk heterojunction based on P(VDF-TrFE):P3HT (10:1) was investigated with a scanning near-field optical microscope of WiTec (Alpha SNOM) that simultaneously records the topography (Fig. 1a) and the transmitted light intensity at  $\lambda=454$  nm (Fig. 1b). Figure 1 demonstrates the phase separation into interpenetrating networks on the order of several tens to several hundreds of nanometers.



**Figure 1** Scanning near-field optical microscopy images of the topography (**a**) and of the transmitted light intensity (**b**) of a spin coated blend of P(VDF-TrFE):P3HT (10:1).

Further investigations of the interfacial morphology was conducted with atomic force microscopy (NanoScope IV-Veeco Instruments). The results (Fig. 2) clearly shows the formation of the two different phases at the interface, where the uniform phase is the region-random, non-crystalline P3HT, and the crystalline phase is P(VDF-TrFE) which is formed upon annealing of the blend. These results demonstrate the phase separation on a length scale of hundreds of nanometers.



**Figure 2** Atomic force microscopy images of the topography (**a**) and of the phase (**b**) of a spin coated blend of P(VDF-TrFE):P3HT (10:1).