Mobility Gradient of Poly(ethylene terephthalate) Chains near a Substrate Scaled by the Thickness of the Adsorbed Layer

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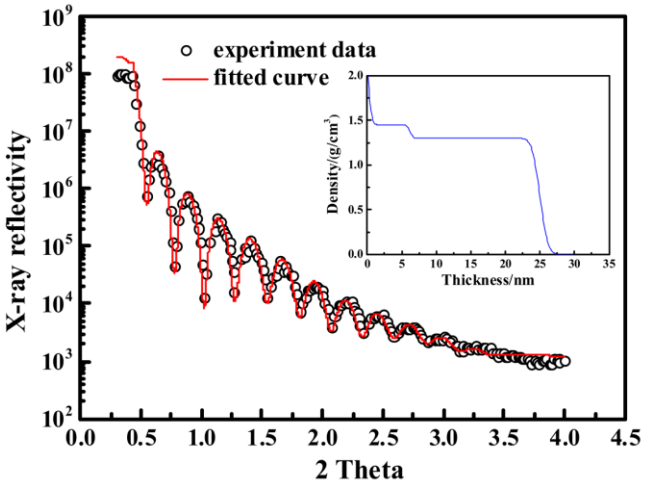

Figure S1. XRR data for a 24 nm-thick PET (30 kg/mol) film with h_{ads} = 6.2 nm annealed at 413 K for 30 min. The inset shows the density as a function of the depth. The density was homogeneous from the surface to the bulk and was the same as its amorphous state.

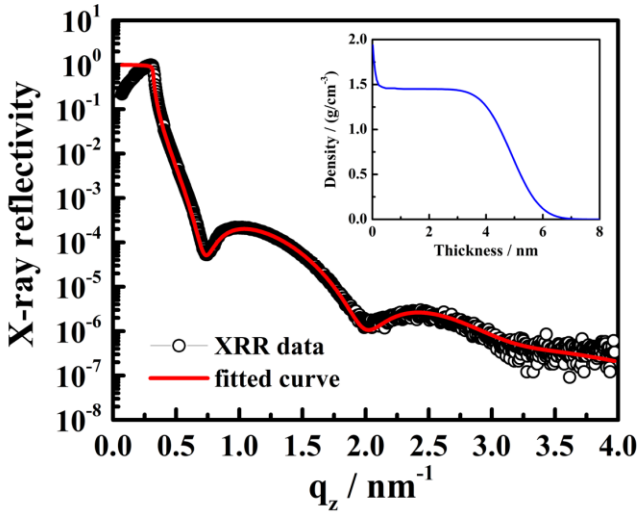

Figure S2. XRR data for lone PET adsorbed layer with 5 nm thick. The inset shows the density as a function of the depth.

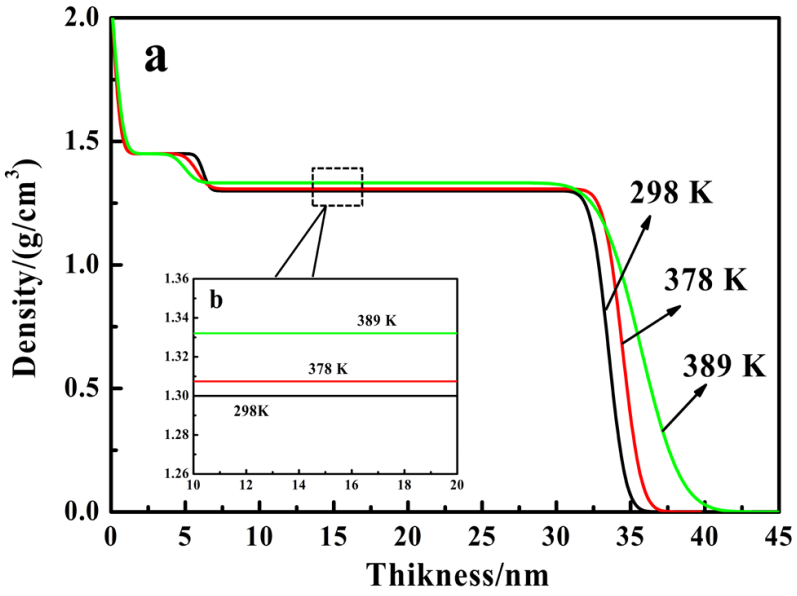

Figure S3. (a) Density profile of a 34 ± 3 nm-thick PET film with h_{ads} = 5.6 nm after the film was heated to 378 K and 389 K at a heating rate of 2 K/min and then measured by XRR. (b) Partial enlarged detail of the dashed box. The density is homogeneous from the surface to the bulk and is greater than that of amorphous PET, which indicates that two crystallization processes become a single crystallization process.

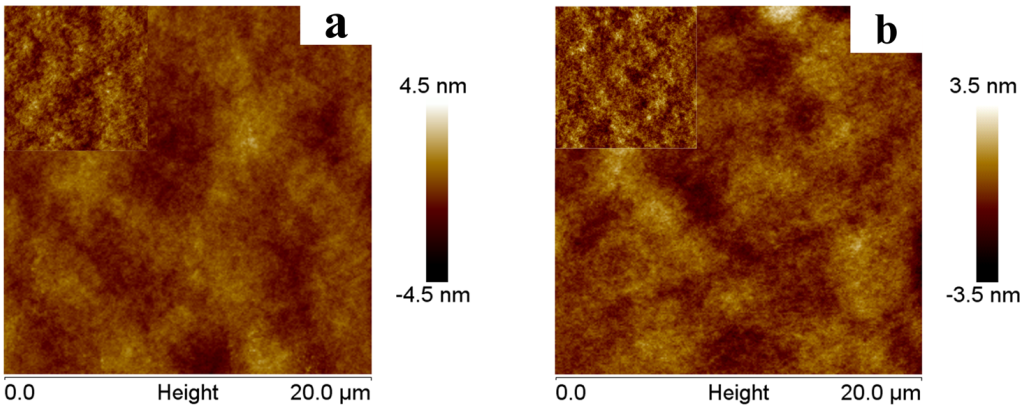

Figure S4. Surface topography of a 24 nm-thick PET film with h_{ads} = 6.2 nm. (a) Melt-quenched PET film. (b) Melt-quenched PET film heated at 413 K for 30 min. The inset image is 5 μm × 5 μm. No crystallization structure is observed.

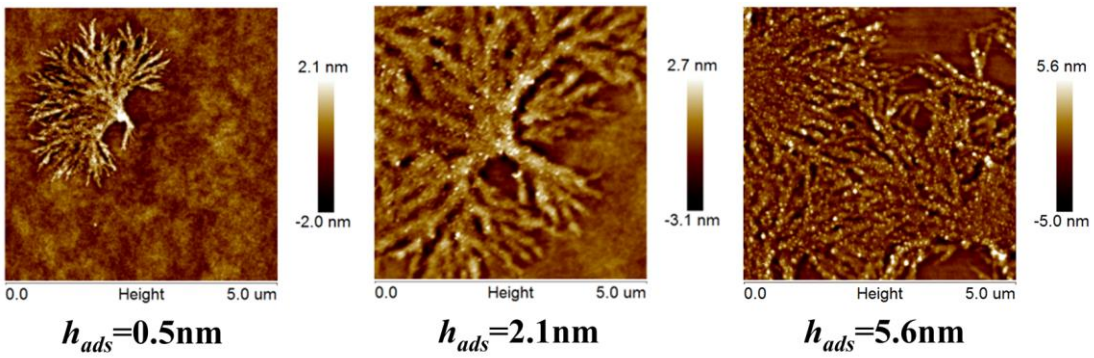

Figure S5. Surface crystallization topography of 24 nm-thick PET films with different h_{ads}.

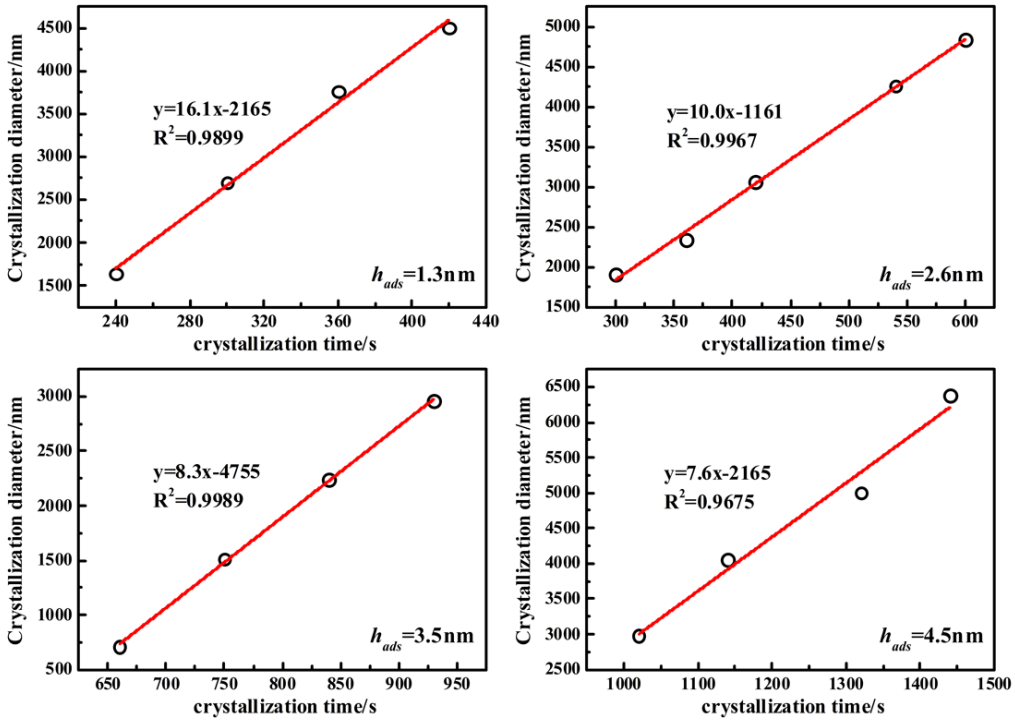

Figure S6. Surface crystallization diameters of 24 nm-thick PET films as a function of the crystallization time at 373 K with various thicknesses of adsorbed layers.

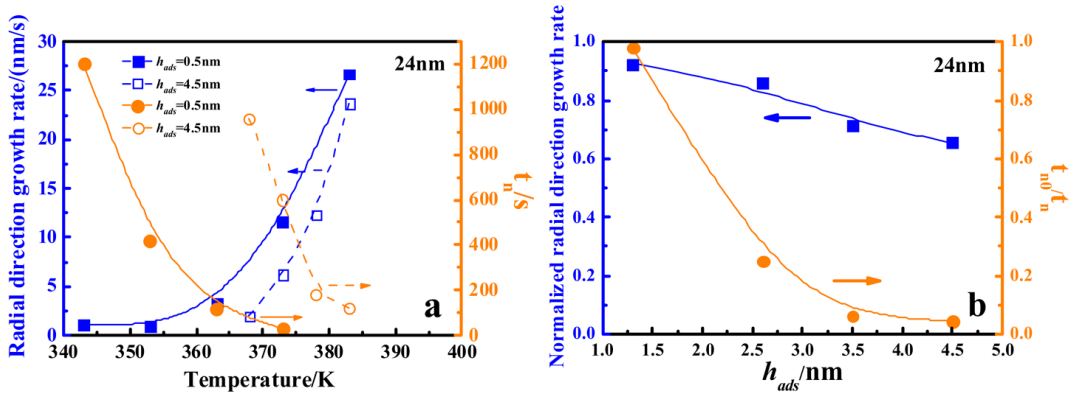

Figure S7. Interfacial effect on the surface crystal growth rate and t_n of supported ultrathin PET film. (a) The crystal growth rate and t_n versus temperature for 24 nm-thick PET films with 0.5 nm- and 4.5 nm-thick adsorbed layers. (b) Normalized crystal growth rate and reciprocal of the t_n of a 24 nm-thick PET film with h_{ads} = 0.5 nm versus h_{ads} on a 24-nm PET film at 373 K. Parameter t_n was defined as the time at which the crystal could be observed by AFM in this study.

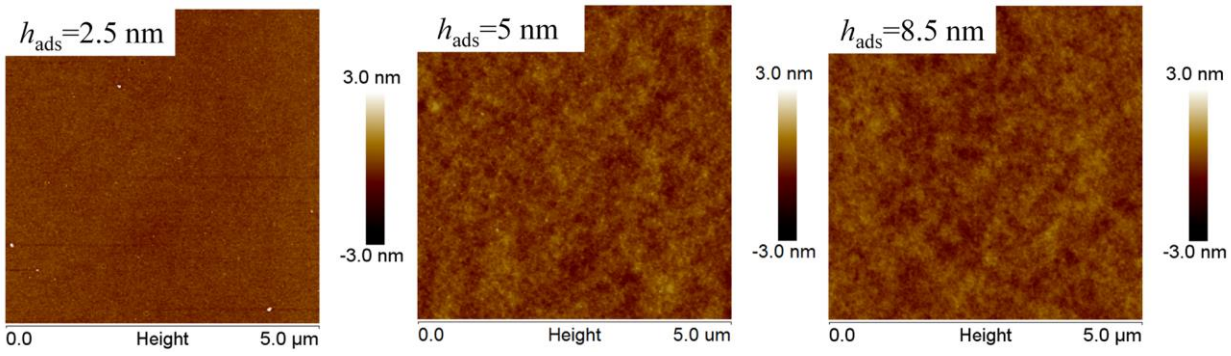

Figure S8. Surface topography of lone adsorbed layers with various h_{ads} heated at 413 K for 30 min. No crystallization structure is observed.