A Two-Dimensional Polymer Synthesized at the Air/Water Interface

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A trifunctional, partially fluorinated anthracene-substituted triptycene monomer was spread at an air/water interface into a monolayer, which was transformed into a long-range-ordered 2D polymer by irradiation with a standard UV lamp. The polymer was analyzed by Brewster angle microscopy, scanning tunneling microscopy measurements, and non-contact atomic force microscopy, which confirmed the generation of a network structure with lattice parameters that are virtually identical to a structural model network based on X-ray diffractometry of a closely related 2D polymer. The nc-AFM images highlight the long-range order over areas of at least 300Œ300?nm2 . As required for a 2D polymer, the pore sizes are monodisperse, except for the regions where the network is somewhat stretched because it spans over protrusions. Together with a previous report on the nature of the cross-links in this network, the structural information provided herein leaves no doubt that a 2D polymer has been synthesized under ambient conditions at an air/water interface.
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