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Crystallization behaviors of *n*-nonadecane in confined space: observation of metastable phase induced by surface freezing DUJIN WANG, BAOQUAN XIE, KLEP, Joint Lab. of Polymer Science and Materials, Institute of Chemistry, CAS, Beijing 100080, China, HAIFENG SHI, XIA DONG, YING ZHAO, CHARLES C. HAN, DUANFU XU, PPCL, Joint Lab. of Polymer Science and Materials, Institute of Chemistry, Chinese Academy of Sciences, Beijing 100080, China. — Crystallization and phase transition behaviors of *n*-nonadecane in microcapsules was studied with the combination of differential scanning calorimetry (DSC) and synchrotron radiation X-ray diffraction (XRD). As evident from the DSC measurement, a surface freezing monolayer, which is formed in the microcapsules before the bulk crystallization, induces a novel metastable rotator phase (R_{II}), which has not been reported anywhere else. We argue that the existence of the surface freezing monolayer decreases the nucleating potential barrier of R_{II} phase and turns the transient R_{II} phase to a ‘long-lived’ metastable phase.

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