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Alignment Behavior of Liquid Crystals on Nanoscopically Heterogeneous Surface KYUNGHEE LEE, HYO KANG, GUIDUK YU, BONG SEOCK KIM, JONG-CHAN LEE, KYUSOON SHIN — We investigated the alignment behavior of liquid crystal molecules (LCs) on highly ordered polystyrene nanorod arrays. The diameter-controlled and height-controlled substrate was obtained from anodized aluminum oxide template. Upon the introduction of 1D nanostructures to the surface, the LC alignment was strongly influenced by the size of surface pattern. When the diameter of nanorods increased, the LC alignment changed from random planar to vertical orientation. The LC orientation was also altered by the increase of the height of nanorods. This transition happened in a small difference of nanorod diameter/height. The orientation change on the variation of nanorod dimension can be explained by the distortion of elastic-energy. The space between adjacent nanorods is sufficiently narrow to impose entropy penalty on LC molecules, and thus the LCs undergo elastic distortion near nanorod surface.

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