

Abstract Submitted
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Structural Reorganization of 4 - Cyano - 4' - octyloxybiphenyl (8OCB) revealed by Fast Scanning Calorimetry¹

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4'-octyloxybiphenyl (8OCB) is a liquid crystal with a few crystalline polymorphic modifications, of which the square plate form is the most elusive. Square plate form was reported to be only solution grown at low temperature and transformed to metastable parallelepiped form immediately even at -20 OC. With the chip calorimeter, we got the smectic glass of 8OCB when it was quenched from the melt with cooling rate of 20, 000 K/s. In the subsequent reheating with rates ranged from 2,000 K/s to 7,000 K/s, we could find two melting peaks located at 310K and 320K, respectively. Under faster heating, the peak at 310K became dominating, while the peak at 320K weakening. At heating rate of 8000 K/s, there was only melting peak of 310K. If further increased the heating rate, the melting peak at 310K would become smaller again because the crystal growth was suppressed until basically invisible at heating rate of about 20,000 K/s. This work shows that the square plate form is the dominating form when grown from the smectic glass, but it starts transforming to the parallelepiped form at heating slower than 8000 K/s. At heating slower than 1000 K/s, the transformation is completed and there is no chance to capture the square plate form.

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