

Supporting Information

Crystal polymorphism of 8OCB liquid crystal consisting of strongly polar rod-like molecules

Subhadip Ghosh^a and Arun Roy^a

^aRaman Research Institute, C.V. Raman Avenue, Sadashivanagar, Bangalore, India.

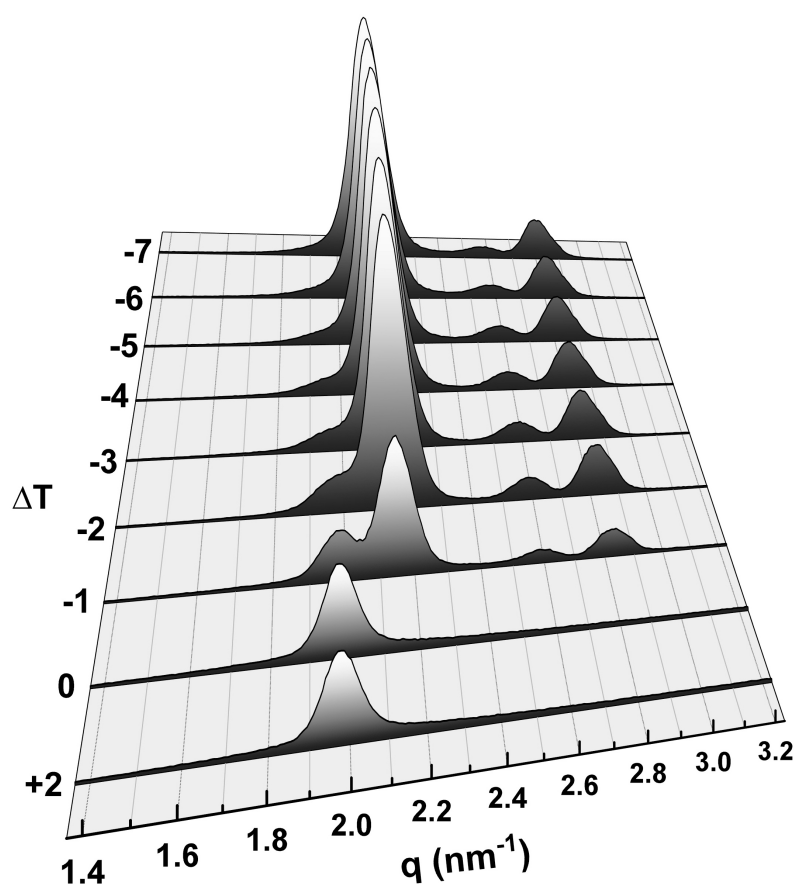


Figure S1: The temperature variation of small angle X-ray diffraction peak profile of CP crystal phase of 8OCB in the pre-translational range during heating it to smectic phase. In the spectral range between 1.4 nm^{-1} to 3.2 nm^{-1} (corresponding 2θ range 1.96° to 4.49°) three crystalline peaks associated with monoclinic lattice structure of CP phase were found. These peak positions are 2.14 nm^{-1} (100), 2.58 nm^{-1} (001) and 2.80 nm^{-1} ($10\bar{1}$) respectively. During heating, (001) peak for smectic phase appeared at $\Delta T = -5K$ from left wing of (100) crystalline peak and from that temperature it started to grow up till the complete melting of CP phase at $\Delta T = 0K$. Here $\Delta T = T - T_c$, where T and T_c are measured temperature and transition temperature of CP phase respectively.

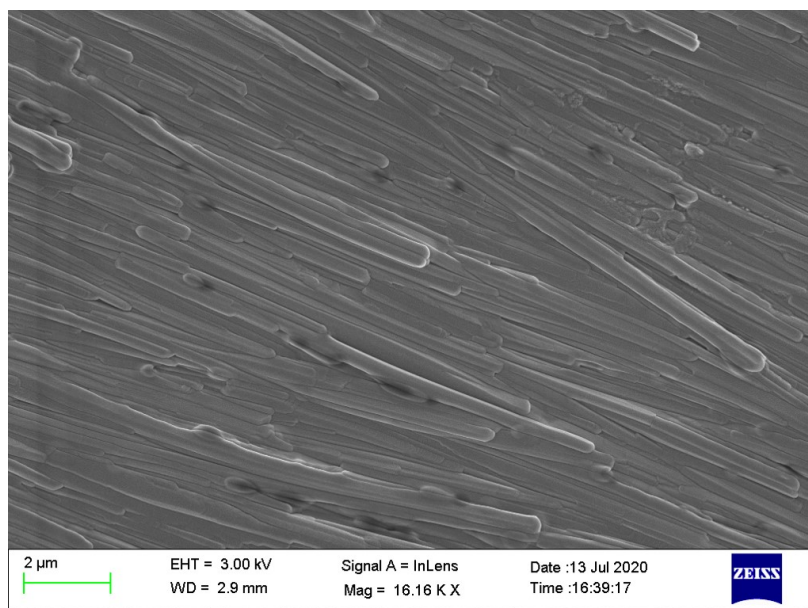


Figure S2: The FESEM texture of CP phase at room temperature after heating it at 326 K. The texture shows that the size of fibrillar crystalline domains have been increased. This increase in nano crystallite component occurred during heating it at 326 K in the pre-transitional temperature range.

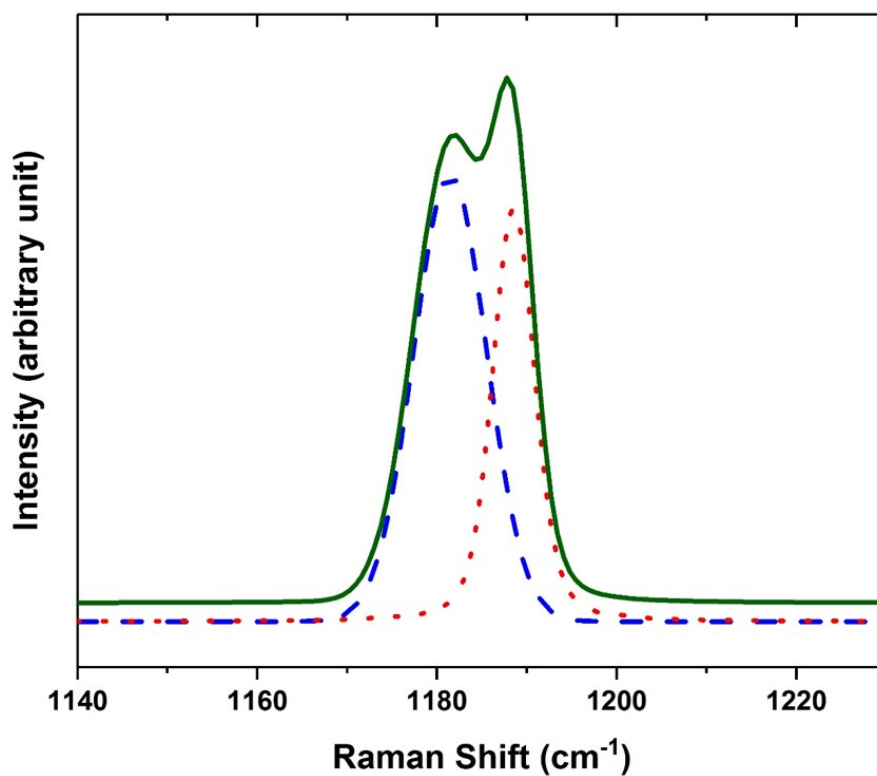


Figure S3: The Raman peak for CH in-plane deformation mode of biphenyl moiety in PP phase of 8OCB. The peak shows doublet texture in this phase and it was fitted with two Voigt functions. The fitted peaks have been represented by red dotted line and blue dashed line whereas the total peak envelope has been shown by green solid line.

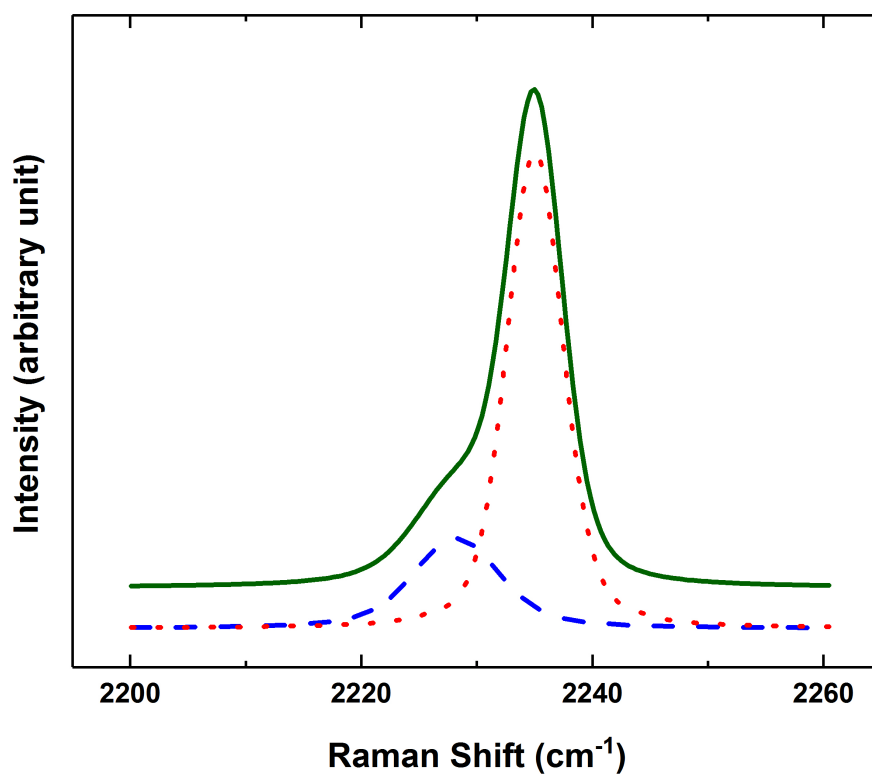


Figure S4: The Raman peak for CN stretching vibration in CP phase of 8OCB. The peak (shown by green solid line in this figure) is asymmetric in this phase and it was fitted with two Voigt functions. The fitted peak with higher Raman shift (shown by red dotted line) is stronger than fitted shoulder peak with relatively lower Raman shift (shown by blue dashed line). This two peaks indicate the coexistence of two different phases in CP phase. These phases are fibrillar crystallites with monoclinic lattice structure and amorphous phase with no lattice structure respectively. The stronger fitted peak belongs to the crystalline subphase while the weak shoulder peak corresponds to the amorphous component of CP phase.