Supplementary Information

Effect of Gelation on the Frank elastic constants in a liquid crystalline mixture exhibiting twist bend nematic phase

S. Vimala, Madhu B. Kanakala, C. V. Yelamaggad and Geetha G. Nair

Figure S1: Chemical structures and phase transition temperatures of the components of NTB-P and NTB-G mixtures, (a) CB7CB, (b) NLC and (c) HSA

Figure S2: Temperature dependence of the storage modulus, $G'$ of the NTB-P and NTB-G systems. The y-axis is in log scale. The vertical red dotted line demarcates the N (sol) phase from the $N_{gel}$ in the NTB-G mixture.
Figure S3: Voltage dependence of capacitance of the (a) NTB-P and (b) NTB-G systems at a reduced temperature \( T - T_{\text{m}} = 10^\circ \text{C} \)
Figure S4: The $K_{33}$ value obtained at a few representative temperatures of the (a) NTB-P and (b) NTB-G systems with the corresponding error limits. For the temperature $T-T_{\text{NTb}} = 35^\circ\text{C}$ of NTB-G, the error bar is within the size of data symbol. Thermal dependence of $K_{33}$ of the (c) NTB-P and (d) NTB-G mixture. The grey and purple shaded rectangles indicate the thermal regime wherein $K_{33}$ cannot be determined reliably for the NTB-P and NTB-G mixtures respectively. The vertical red arrow in (d) demarcates the $N$ (sol) phase from the $N_{\text{Gel}}$ in the NTB-G mixture.
Figure S5: Comparison of the thermal dependence of all the three Frank elastic constants for the (a) NTB-P and (b) NTB-G mixtures.

Figure S6: Thermal dependence of the average elastic constant, \((K_{11} + K_{33})/2\) for the NTB-P and NTB-G mixtures (a) in the entire thermal range and (b) expanded view of the profiles in the nematic phase. The vertical red arrow in (a) demarcates the N (sol) phase from the \(N_{\text{gel}}\) in the NTB-G mixture.
Figure S7: XRD profiles of (a) NTB-P and (b) NTB-G mixtures exhibiting the low angle peaks (shown inside the dotted rectangle) 'A', 'B' along with the HSA peak ‘H’ and the wide-angle peak ‘C’