Electronic Supplementary Material (ESI) for RSC Advances

Dependence of pretilt angle on orientation and conformation of side chain with different chemical structure in polyimide film surface

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Supporting Information

Figure S1. The FT-IR spectra of PI-BBC4 polyimide films with different side chain content.

Figure S2. The FT-IR spectra of PI-C6BB polyimide films with different side chain content.

Figure S3. The FT-IR spectra of PI-C6BBC4 polyimide films with different side chain content.

Figure S4. Conoscopic POM images of the LC cells made from PI-BBC4 and PI-C6BBC4

Figure S5. The optical micrographs of the LC used un-rubbed PI-C6BBC4-85 before heating processing (a) and after (b) and the corresponding interference patterns of convergent light.

$$I_Z = \sin\theta \bullet I \bullet \cos\varphi \qquad \text{eq. (S1)}$$

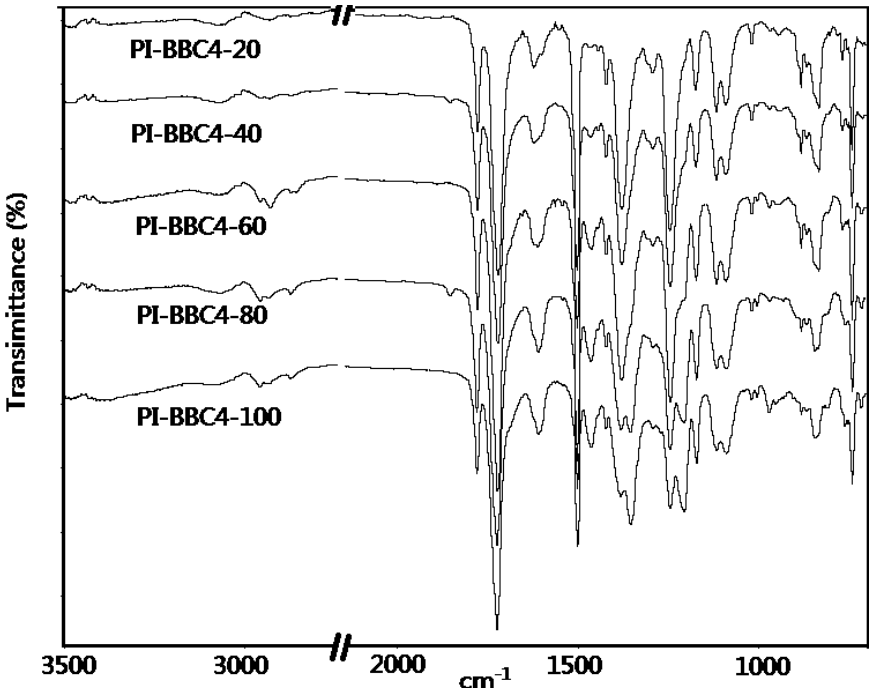

Figure S1.

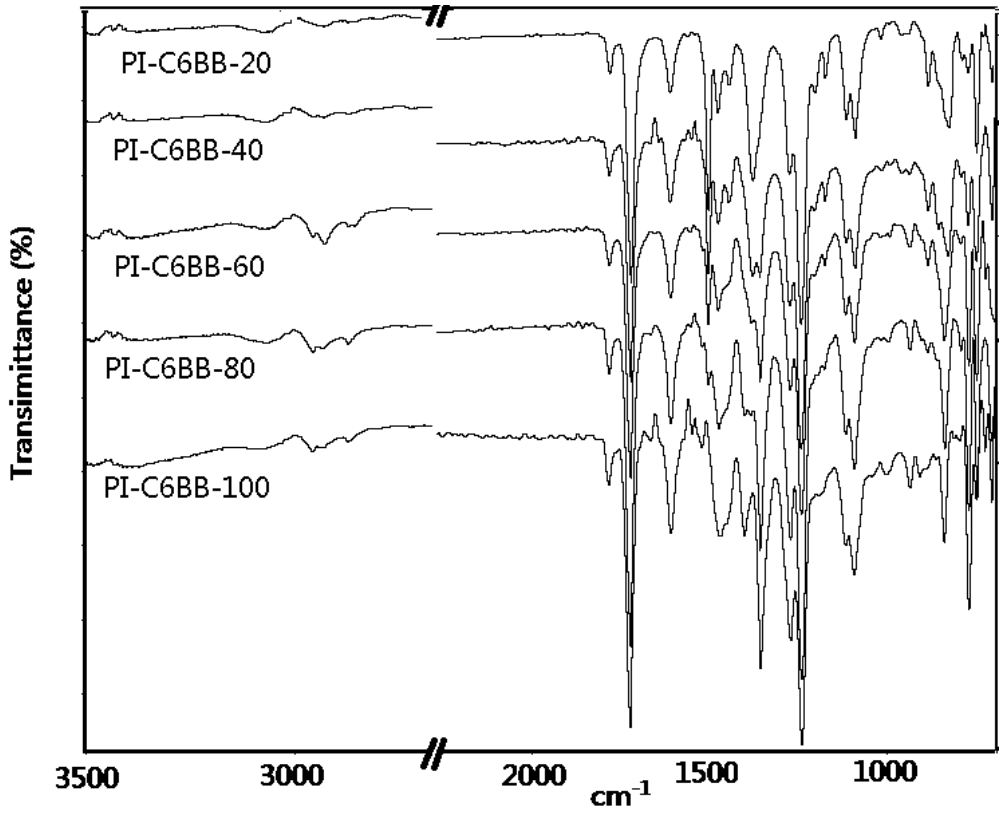

Figure S2.

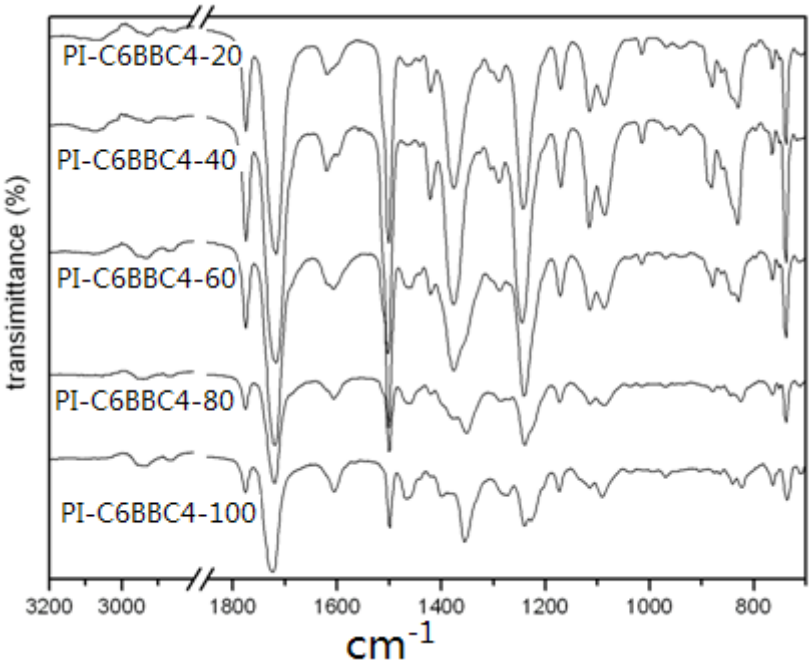

Figure S3.

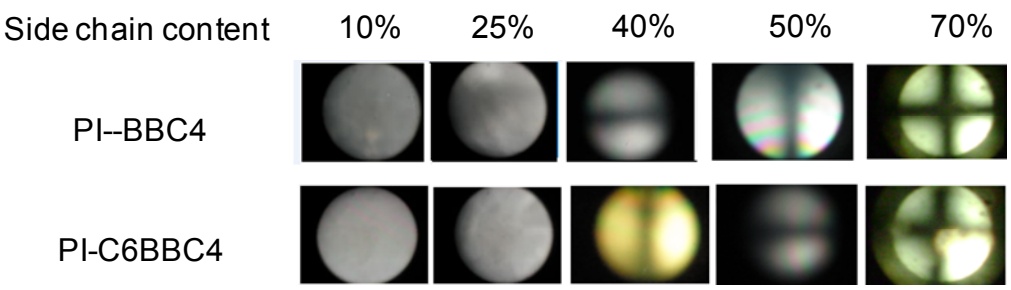

Figure S4

As the Figure S4 shown, the LC cells fabricated from PI-BBC4 and PI-C6BBC4 show the change of LC alignment from homogeneous to vertical alignment.

On the contrary, All LC cells from the PI-BB and PI-C6BB films with different side chain content show the homogeneous planar LC alignment.

Stability of the pretilt angle

These LC cells using these PI films as the alignment layer were baked in oven at 10 °C for 5h to test the thermal stability of the pretilt angle. The transmittance was uniform in a large area, it could be confirmed that the alignment of LCs was uniform and ordered. This indicated that the alignment stability of thess LC cell is excellent.

Take PI-C6BBC4 for example, the polarized optical micrographs of the LC cells before and after heating are uniform, as shown in Figure S5, which indicates the excellent alignment stability of alignment of LC molecules in this cell.

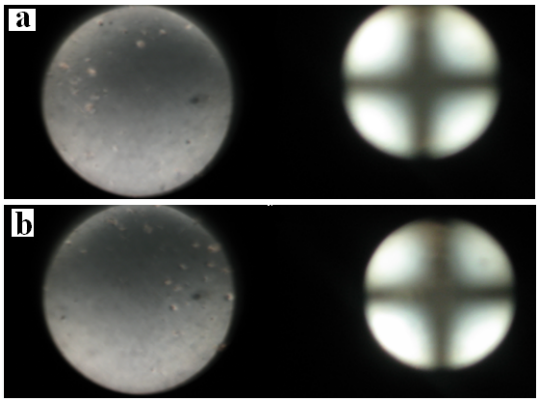

Figure S5