

Bend-core Liquid Crystal Based on 4,4'-Sulfonyldiphenol

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17A1 W20 - X-ray Powder Diffraction.

Homologues of bend-core molecule consisted of 4,4'-sulfonyldiphenol as the central core and two arms having 6 peripheral chains were synthesized (Fig.1).

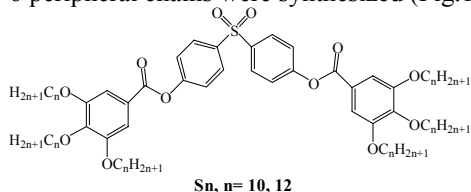


Figure 1.

The mesophase behaviors of these two compounds ($n = 10, 12$) are summarized in Table 1. All of them are columnar mesophases at room temperature, and the fan-shaped texture were observed by optical polarized microscopy (showed in Fig. 2).

The X-ray diffraction pattern of **S10** displays a very strong peak and two tiny peaks in the small angle region (Figure 3a). The spacing of the small angle peaks are $29.39:16.99:14.68 \text{ \AA} = 1:0.577:0.5$. This result indicates that the columns are hexagonally packed in the mesophase. A broad band without sharp peak is observed in the large angle region indicates that the molecules are disorder within the column. Compound **S12** also has the similar results.

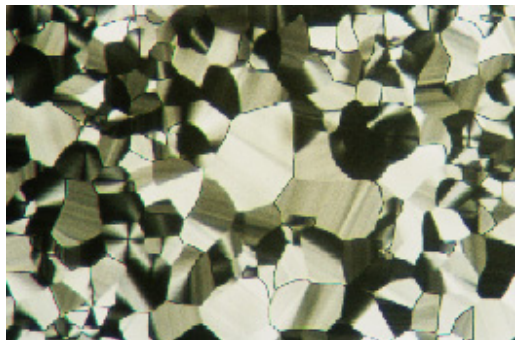


Figure 2. The fan-shaped texture of **S10** at 27.6 °C.

Table 1. The phase behaviors for compounds **S10** and **S12**. Temperature in °C, and enthalpy change (in parenthesis) in kJ/mol.

compound	phase behavior
S10	Col _h 32.6 (13.2) I
S12	Col _h 36.3 (13.9) I

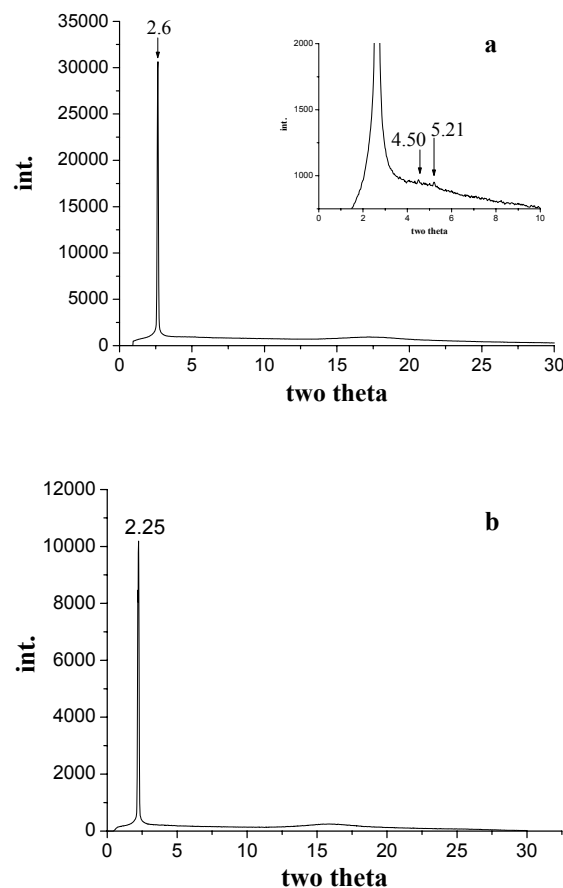


Figure 3. The X-ray diffraction pattern :

(a) **S10** at 30 °C

(b) **S12** at 31 °C