

Novel bent-shaped liquid crystals with unusual mesophase sequence

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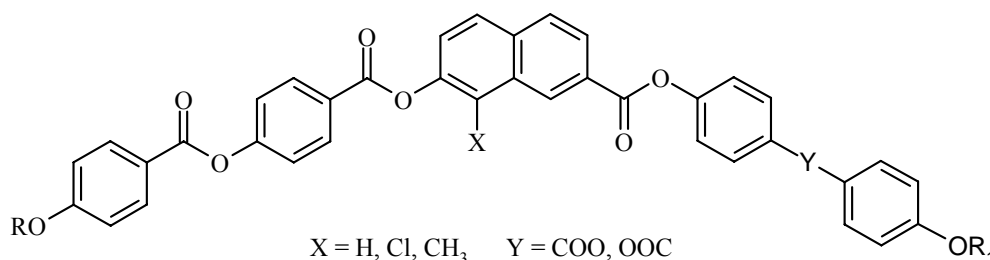
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Recently, we have found [1,2] that mesomorphic properties of materials based on laterally substituted naphthalene-2,7-diol strongly depend on the character of the substituent and the terminal chain. Herein, we report synthesis and physical properties of related materials, nonsymmetrical liquid crystals based on (8-laterally substituted) 7-hydroxynaphthalene-2-carboxylic acid. The influence of the lateral substituent, length of the alkyl chains, number and orientation of ester functionalities was studied. Physical properties have been studied by texture observation and differential scanning calorimetry, for some compounds x-ray analysis of the structure has been performed.

Orientation of the ester group in position Y (COO vs. OOC) showed strong influence on type of the formed mesophase. For compounds with Y=OOC the lamellar B₂ phase was observed for homologues with longer chain, for shorter homologues two-dimensional (2-D) columnar phases (B_{1REV} or B_{1REVTilted}) were found. For several homologues the nematic phase occurred on cooling above the switchable columnar phase, which is quite unique for liquid crystals composed of bent-shaped molecules. For compounds with Y=COO the B₁, S_mA and/or columnar phases were observed.

References

1. J. Svoboda, V. Novotná, V. Kozmík, M. Glogarová, W. Weissflog, S. Diele, G. Pelzl *J. Mater. Chem.* **2003**, *13*, 2104.
2. V. Kozmík, M. Kuchař, J. Svoboda, V. Novotná, M. Glogarová, U. Baumeister, G. Pelzl *Liq. Cryst.* **2005**, *32*, 1151.



X = H, Cl, CH₃ Y = COO, OOC

R = C₈H₁₇, C₁₀H₂₁, C₁₂H₂₅, C₁₄H₂₉, C₁₁H₂₁

R₁ = C₈H₁₇, C₁₀H₂₁, C₁₂H₂₅, C₁₄H₂₉, C₁₁H₂₃