

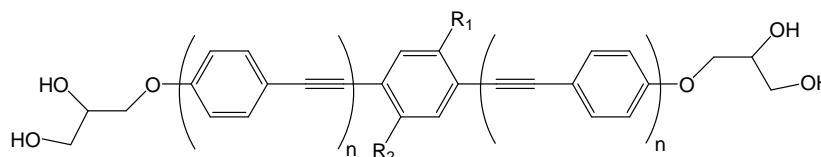
Synthesis and self-organisation of oligo(phenyleneethynylene) based bolaamphiphiles

C. Nürnberger^a, B. Glettner^a, H. Ebert^a, M. Prehm^a, F. Liu^b, X. Zeng^b,
G. Ungar^b, C. Tschierske^a

a Institute of Organic Chemistry, Martin-Luther-Universität Halle Wittenberg,
Kurt-Mothes-Str. 2, 06120 Halle/Saale, Germany

b Department of Engineering Materials, University of Sheffield S1 3JD, UK

In several studies, the mesophase morphologies of T-shaped bolaamphiphiles with one lateral substituent have been investigated¹. Such compounds exhibit different types of lamellar and columnar phases. The columnar mesophases represent honeycomb-like arrays of polygonal cylinders. With molecules consisting of three incompatible parts, the interior of all cylinder cells is identical. In our recent investigations, an additional substituent (R_2), incompatible with the first one (R_1), was attached in lateral position at opposite sides of the rod-like core to give X-shaped bolaamphiphiles.²



Herein, series of oligo(phenyleneethynylene)derived bolaamphiphiles are reported, which lead to new LC phases with rhombic, square and triangular shape of the cylinder cross section. In addition, a separation of the distinct lateral chains into different cylinder cells (multicolour tiling patterns) was observed in some cases. The mesophase behaviour of the synthesized compounds was investigated by means of polarization microscopy, differential scanning calorimetry and X-ray scattering and was confirmed by electron density maps calculated from X-ray data.

Acknowledgement

This work, as a part of the ESF EUROCORES Programme SONS, project SCALES, was supported by funds from the DFG and the FP6 under contract No. ERAS-CT-2003-989409

References

- (1) C. Tschierske, *Chem. Soc. Rev.*, **2007**, 36, 1930.
- (2) B. Glettner, F. Liu, X.-B. Zeng, M. Prehm, U. Baumeister, M. Walker, M. A. Bates, P. Boesecke, G. Ungar, C. Tschierske, *Angew. Chem. Int. Ed.* **2008**, 47, 9063.