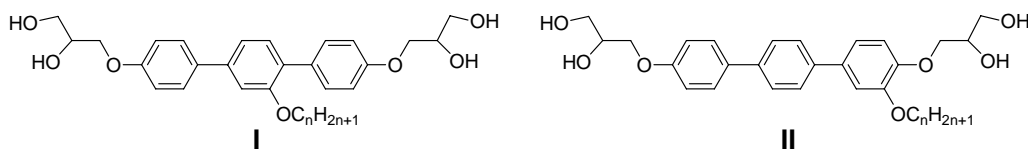


New complex mesophases formed by T-shaped *p*-terphenyl based bolaamphiphiles

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Low molecular weight block-molecules such as rigid bolaamphiphiles with lateral chains have become a field of increasing interest in the recent years. These polyphilics were designed in such a way that the organization favored by their shape is in competition with the driving force for microsegregation of their different incompatible parts (amphiphilicity). It was shown that this combination leads to the formation of exciting novel mesophase structures.[1]



Here we report about the polyphilic molecules **I** and **II**, shown above. The compounds were investigated by DSC, polarizing microscopy and different X-ray diffraction techniques with respect to their organization in thermotropic LC phases. Three new LC phases were found for these compounds, one is a rectangular honeycomb resulting from the distortion to a square honeycomb. The second one is a new kind of deformed hexagonal honeycomb. The third one is a new type of hexagonal 3D mesophase combining layers and cylinders, which is the inverse of the previously reported channeled layer phase.[1] For compounds **I** a transition from distorted layers to a series of columnar cylinder structures (from squares via rectangles to pentagons and hexagons) was found by enlarging the lateral chain. The phase sequence of the related compounds **II** is dominated by layer structures and the 3D-Hex phases which are replaced by pentagonal and hexagonal cylinders only for very long chains.

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[1] C. Tschierske, *Chem. Soc. Rev.*, **2007**, *36*, 1930.