

## **ORDER AND FRUSTRATION IN LIQUID CRYSTALLINE HOMO - AND BLOCK - DENDRIMERS**

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We report on the structure and phase behavior of liquid crystalline dendrimers of various generation containing either the same terminal mesogenic groups, - homo- dendrimers, or the end groups of different nature, - block-dendrimers. X-ray diffraction data revealed monolayer smectic phase for carbosilane homo-dendrimers with generations from one to four, while higher order fifth generation shows columnar phase, which is characterized by two dimensional centered rectangular lattice of the  $C2mm$  symmetry. The columnar phase shows defect structure similar to observed earlier in main- chain liquid crystalline elastomers [1]. The block dendrimer of second generation with aliphatic (decyl) and mesogenic (azobenzene based) terminal groups shows bilayer smectic phase with the spacing about twice of that in homodendrimers. X-ray reflectivity from the thin films of block dendrimers on substrate has been used to elucidate precise structure of the bilayer smectic ordering. The smectic layers are well modeled by four slab model with high electron density in the region of overlapped aromatic moieties and low density for coiled hydrocarbon chains. The data suggest that in blockdendrimers the segregation occurs between chemically distinct aromatic and aliphatic moieties – the process similar to layer formation in block copolymers or polyphilic liquid crystals.

[1] W.H. de Jeu, E.P. Obraztsov, B.I. Ostrovskii, W. Ren, P.J. McMullan, A.C. Griffin, A. S´anchez-Ferrer, and H. Finkelmann, *Eur. Phys. J. E* 24, 399–409 (2007)