

MS35-P18 | CRYSTAL STRUCTURES OF CHOLESTEROL BASED PHOTO-SWITCHABLE MESOGENIC DIMERS. STRONGLY BENT MOLECULES VERSUS AN INTERCALATED STRUCTURE.

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Liquid crystals, being the unique compounds combining the properties of two states of matter – anisotropy of the solid state and fluidity of the liquids, have always been an important class of functional materials [1].

Here we present our studies in the area of self-assembly of liquid crystalline materials. The subject of research is a homologue series of bent-shaped mesogenic dimers with different length of a terminal alkoxy chain. The photosensitivity of mesogenic molecules gives possibility for manipulating the structure of liquid crystalline phase by light. Compound with the shortest alkoxy tail exhibits heliconical twist-bend nematic phase (N_{tb}). Elongation of the terminal alkoxy chain prevents formation of N_{tb} phase, for compounds with longer tail instead of N_{tb} phase, SmA is observed, which is rather unique for bent-shaped dimeric mesogens.

Crystal structures presented here shed new light on possible molecular conformation and arrangement of molecules in liquid crystalline phase. We have shown that, in addition to the model of intercalated molecules, special attention should be paid to the model of strongly bent molecules. New model of molecular packing of bent-shaped dimers with flexible linker in SmA phase is proposed [2].

The studies presented here show that insightful crystal structure analysis allows future design of liquid crystalline materials with the strictly required properties.

[1] Q. Li, Nanoscience with Liquid Crystals: From Self-Organized Nanostructures to Applications, Springer, Heidelberg, 2014.

[2] A.Zep, K.Pruszkowska, Ł.Dobrzycki, K.Sektas, P.Szałański, P.H.Marek, M.K.Cyrański and R.R.Sicinski, CrystEngComm, 2019, DOI: 10.1039/C9CE00013E.