LIQUID CRYSTAL PHASES BASED ON FLUORENONE CORE

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Dynamic chirality synchronization of supramolecular aggregates in liquids and liquid crystals is a new mode of mirror symmetry breaking, providing chiral fluids of non-chiral compounds with long-term stability even at high temperatures [1]. Formation of networks and, particularly, network junctions seems to be the key to the long-range propagation of homochirality [2, 3]. Depending on the lattice symmetry the cubic phases of rod-like and polycatenar molecules are achiral (double gyroid phase - Ia3d) or chiral triple network - Im3m); therefore, the molecular design play an important role for the achievements of new supramolecular structures with specific required properties. Here, we present the design, synthesis and characterization of first examples of fluorenone derivatives displaying bicontinuous cubic phases. The synthetized compounds show columnar, double gyroid and the triple network phase. The Ia3d seems to be preferred at higher, and Im3m at lower temperatures.
These fluorescent compounds also have the potential to be used as electro- or photoluminescent materials in devices that may emit circularly polarized light.

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