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Title: Hexa-peri-hexabenzocoronene Discotics: Synthesis and Characterization

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Abstract: This thesis deals with the design, synthesis and characterization of new alkoxy substituted discotic liquid crystals based on hexa-peri-hexabenzocoronene core. The synthesis of these molecules is very challenging since the alkyl bond with oxygen in the peripheral region is less stable. So here, we aimed to synthesise a new HBC core with alkoxy substituents with better properties. First chapter deals with the basic introduction of LCs, its classification along with the reason for our interest in HBC core liquid crystals. It includes a brief introduction for why hexabenzocoronene core is so important. Discotic LCs have a wide range of application in the opto-electronic field. Conductivity along the columns in columnar mesophases has been reported to be several orders of magnitude greater in the parallel direction than in the perpendicular direction. Thus the columns may be described as molecular wires or more appropriately molecular cables. Even though the conductivity is very good along the columns, the physical and electronic properties of the molecules are not much suitable for the optical devices. The introduction of heteroatoms such as oxygen, nitrogen, and sulphur into the nanographene core as well as functionalization with heteroatom substituents can lead to significant changes in the electronic and optical properties. So we designed our target molecule accordingly with favourable modifications and gave our maximum effort to synthesise the compound. Second chapter includes the synthesis schemes we followed and the results along with the experimental procedures. In the third chapter, conclusions and the future work which can be carried out is stated.

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