Title:	Room temperature tricarboxamide based aggregation-induced emissive columnar liquid crystals and their application in OLEDs
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Abstract:	The use of fluorescent AIE discotic liquid crystals in the fabrication of OLEDs is another application of liquid crystals that are quite useful to explore. Liquid crystalline materials being dynamic system can produce the self-healable thin films that can increase the durability of the devices. The processing of the thin films by solution-processable technique is quite feasible with the use of liquid crystal systems. In this direction we have synthesized room temperature discotic liquid crystalline materials. This thesis includes the design and synthesis of aggregation-induced emission enhanced (AIEE) columnar liquid crystals (LCs) containing benzene-1, 3, 5-tricarboxamide central core attached to three cyanostilbene derivatives based DLCs followed by their characterization and application in OLED devices. We synthesized three compounds varying carbon chain (C 8 , C 10 and C 12) which show columnar liquid crystalline behaviour that have been verified and characterized through POM, DSC and XRD studies. The thermal stability of all the materials has been checked by TGA and the materials exhibit high thermal stability. The first chapter of the thesis consists of an introduction to soft matter and liquid crystals followed by the history, properties, classification and application of liquid crystals. The second chapter of the thesis deals with a brief introduction to the instruments and characterization methods of discotic liquid crystals and the working principle of the various techniques being used to carry out the thesis research work. The third chapter deals with the detailed synthesis, structural characterization by NMR and HRMS technique, Thermal characterization by POM, DSC, XRD and TGA, photophysical studies, electrochemical and theoretical studies, and then finally the application of the final materials as emitters in OLED devices. The fourth chapter summarised the work carried out during my MS thesis project along with the pending research work need to be done in order to make the work publishable.
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