



INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI
SHORT ABSTRACT OF THESIS

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SHORT ABSTRACT

Liquid crystals (LCs) are unique functional soft materials combining both order and mobility on molecular, supramolecular and macroscopic levels. The shape anisotropic molecules which exhibit this unique behavior are also known as mesogens. They can be organic (forming thermotropic and lyotropic phases), inorganic (metal oxides forming lyotropic phases) or organometallic (metallomesogens) in nature. Conventionally, the anisometric molecules employed to stabilize thermotropic LC phases are either rod-like (calamitic) or disc-like (discotic). Calamitics form the backbone of the well-established flat panel display industry. Discotic LCs also have made notable progress in recent years, both from scientific and application viewpoints and slowly they are finding a foothold in the main stream of organic electronics. The discotic LCs mainly exhibit either N phase or columnar (Col) phase. The arrangement of disc-like molecules with a long-range orientational order stabilizes the N phase, while the stacking of these disc-like molecules one above the other leads to the stabilization of Col phase. In this thesis, several perylene based molecular designs that stabilize Col LC phases and their utilization in OLED devices have been discussed.