Fabrication of anisotropic materials via molecular self-organization

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Organic materials have potential applications as optical and electronic materials, in luminescent devices, and in microelectronic fields. The properties of organic materials and the performance of devices based on these materials are strongly influenced by the molecular order and intermolecular interactions in the solid state. Materials in which the organic molecules are anisotropically (directionally) oriented possess unique direction-dependent properties that are unattainable from materials in which molecules are randomly oriented. Our research group investigates the structural factors that govern the self-organization of ionic organic compounds into chromonic liquid crystals and crystals with anisotropic electronic transition and fluorescence properties. Polarizing films and micropatterns of anisotropic fluorescent materials were fabricated by exploiting the self-organizing properties of these compounds.