Synthesis and Self-Assembly of Novel Aromatic Compounds: Controlling Molecular Organization

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Abstract

Novel aromatic compounds are of considerable interest for their potential applications in organic electronics. Aromatic compounds feature tunable electronic properties such as HOMO-LUMO gap and are also predisposed to self organize through characteristic arene-arene interactions. Indeed, the self-organization of aromatic compounds plays a critical role in determining the properties of the bulk material. In our lab, we are interested in the synthesis of novel aromatic compounds in order to better understand their self-organization in ordered phases such as liquid crystals and crystalline solids. In this presentation, I will highlight some of our recent efforts directed at the synthesis of novel polycyclic aromatic hydrocarbons (PAHs) derived from dibenz[a,c]anthracenes, trinaphthylene, and acenequinone. I will also describe how these compounds self-assemble to form columnar liquid crystal phases, and how molecular structure influences liquid crystalline properties.