

Synthesis and Properties of Chiral Molecules Using Linked Naphthalenes

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We have been studying rod-shaped chiral oligonaphthalenes consisting of naphthalene rings linked at the 1,4-position. In recent years, we have been synthesizing helical compounds using oligonaphthalene as an axis and introducing dyes (such as BODIPYs) around the axis using the hydroxyl groups at the 2,3-position of each naphthalene as scaffolds, and evaluating their functions. The orientation of added dyes can be precisely controlled by character of connecting elements between the naphthalene rings and the outer components. For example, if boron is selected as the connecting element, the outer dyes are arranged orthogonally to naphthalene rings (Figure 1).

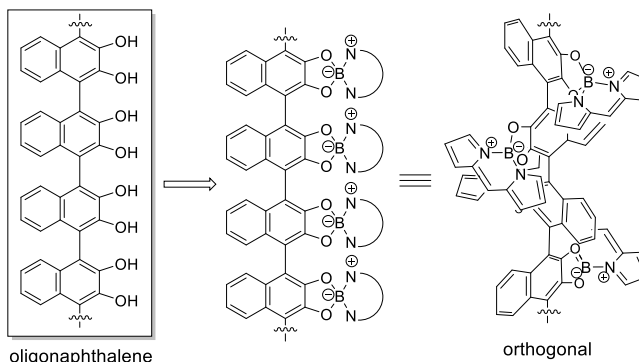


Figure 1. Oligonaphthalene with a Helical Arrangement of Dyes.

In the above study, the dihedral angles between the naphthalene rings are fixed at about 90 degrees, therefore, the interactions between the upper and lower naphthalene rings are negligible. For the next idea, we are now synthesizing compounds in which the dihedral angle of binaphthol are controlled by linking two hydroxyl groups with alkyl chains and dyes are introduced at 6,6'-position of the binaphthol (Figure 2).

We will talk about the synthesis and optical properties of these molecules in this presentation.

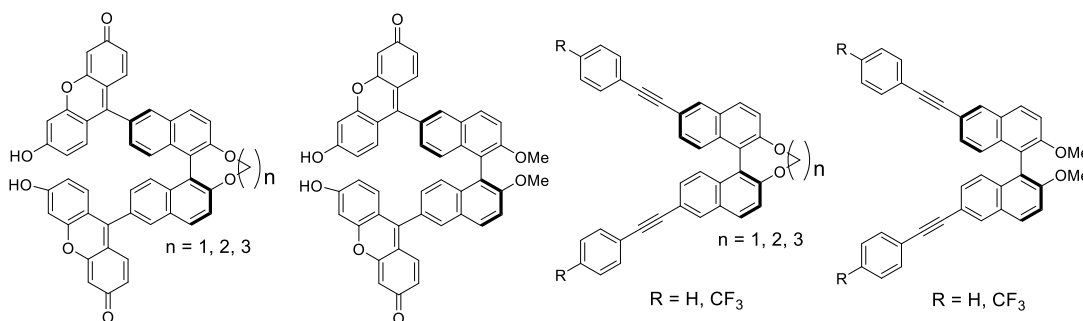


Figure 2. Compounds focusing on Dihedral Angle of Binaphthyl