

Metallosupramolecular Cages from BINOL-Based Ligands

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BINOLs are versatile building blocks with various applications in asymmetric catalysis and are interesting in metallosupramolecular chemistry as C_2 symmetric chiral building blocks due to their easy accessibility and modifications, most prominent in the 3 and 6 position directly accessible from BINOL. Other constitutional isomers can be synthesized by oxidative coupling of the naphthyl subunits. BINOLs display a high degree of rotational freedom along their 1,1'-axis which can also be limited through Williamson etherification to a specific angle between both naphthyl units by choosing a specific bridge. The coordinating motifs are easily introduced by cross-coupling reactions. So, a large family of related ligands with different size and geometry is easily accessible.

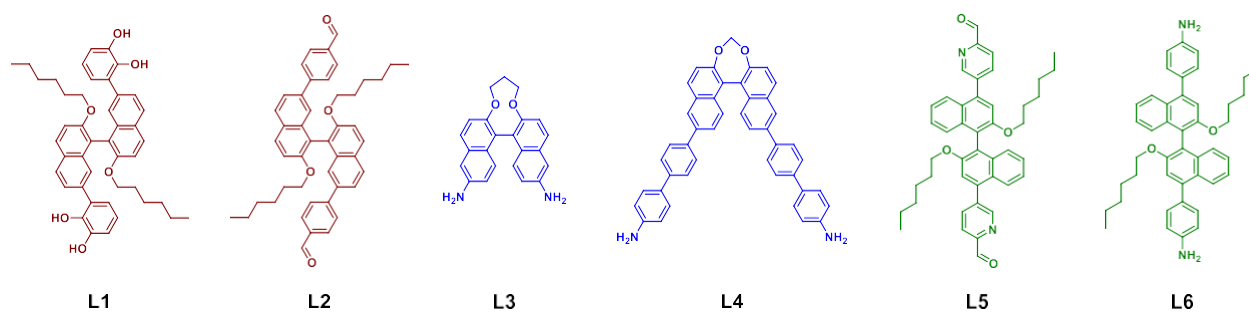


Figure 1: Overview of (pre)ligands for metallosupramolecular cages.

The subcomponent self-assembly approach in metallosupramolecular chemistry offers an easy synthesis of chelating ligands which can be used for aggregates based on the Symmetry Interaction approach. Octahedral iron(II) and cobalt(II) are employed for imine-based ligands and titanium(IV) for catechol-based ligands. Interchanging ligands and metal cations will have a significant impact on the formation, composition, geometry and properties of metallosupramolecular cages.

References:

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