Molecular cages: from sensing to MRI and catalysis

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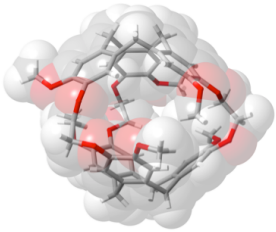
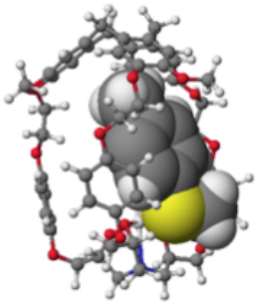
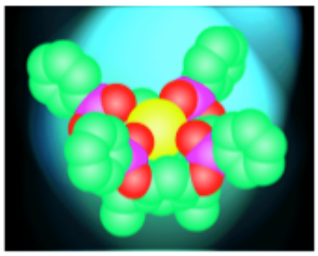
Molecular cages constitute a flourishing domain of supramolecular chemistry for their interest in host-guest chemistry. Among them, cryptophanes,[1] hemicryptophanes[2,3] and cavitands[4] are organic molecular receptors endowed with remarkable complexation properties. They have been developed for several decades to lead to more efficient synthetic molecular receptors and have opened the route for further applications connected for instance with stereo-selective recognition of chiral guests. An important topic, recently developed, concerns the encapsulation of small gaseous molecules. For example, the complexation of xenon by cryptophanes is of great interest for the design of biosensors for medical imaging by NMR (MRI).[5,6] This has been enlarged to gaseous molecules of growing interest, like methane widely available in nature and that could provide a cleaner energy resource. Different approaches have been developed in recent years to achieve endohedral functionalization of the inner cavity of molecular cages, and to make them attractive for different applications, featuring novel approaches in chiral recognition and in supramolecular catalysis.[7,8] The synthesis of these molecular receptors, their properties and their potential applications, such as the recognition of biological targets (the concept of biosensing), the recognition of gases of environmental importance, and the design of new catalysts will be presented.

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