

Polynuclear Lanthanide Assemblies: How to Design Multifunctional Systems

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Polynuclear lanthanide complexes represent interesting chemical systems, which may provide peculiar optical and magnetic functionalities useful in different applications. Such compounds can be advantageously accessed by a supramolecular self-assembly under thermodynamic and kinetic control. However, a successful application of this approach requires a meticulous design of organic multidentate platforms to ensure stereochemical matching between components. For several years we are interested in designing new tripodal ligands and in better understanding of their interactions with lanthanides in self-assembled polynuclear complexes. In this lecture, we will present different aspects of this chemical design. Several polytopic organic receptors will be introduced with the focus on specific anchoring moieties. Structural and physico-chemical properties of related three-dimensional edifices will be presented in detail. Thermodynamic characteristics will be discussed with respect (i) to the control of self-assembly processes and (ii) to possible predictions of new supramolecular functional compounds. Potential applications in bioanalytics, optical imaging or nanomaterials will be also evoked.