

How it is made: lanthanide complexes with opto-magnetic properties.

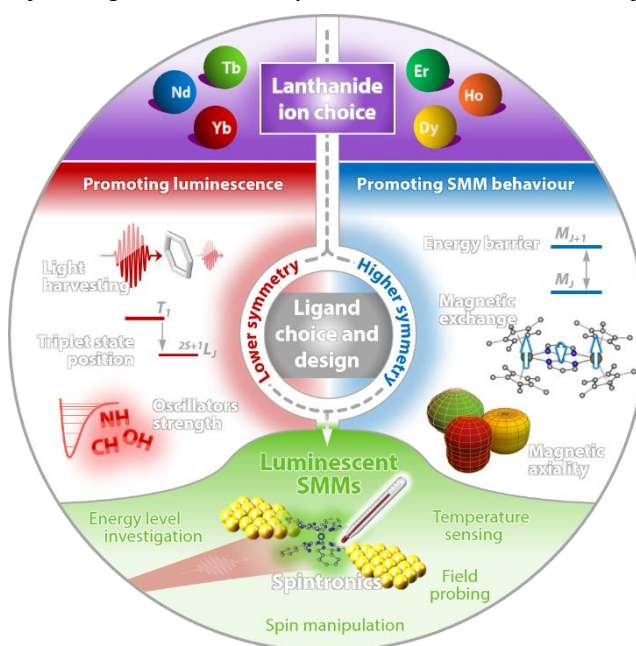
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Lanthanide complexes are the subject of intense research owing to their unique optical and magnetic properties. Lanthanide-based single-molecule magnets (SMMs) hold great promise for their future application in miniaturized data storage devices, while luminescent lanthanide complexes are suitable candidates in applications such as optical sensing, illumination and optical thermometry.

The properties of lanthanide complexes are governed by the synergy between the metal center(s) and the ligands. Ground state spin, magnetic anisotropy, and relative position of the energy levels are some of the parameters that have to be considered in the design of lanthanide complexes with specific properties of interest. To that end, particularly fascinating are complexes that simultaneously display magnetic and optical features. Not only spectroscopic analyses allow investigating the fundamental electronic properties of the system, thus better understanding its magnetic behavior. Most importantly, magnetism and luminescence can be simultaneously harnessed to obtain molecules with unprecedented applicative potential.

In this lecture, the design strategies to prepare lanthanide complexes with opto-magnetic properties will be outlined. Different examples of such species will be presented, with a keen eye on a family of dinuclear lanthanide complexes $\{Ln_2\}$ based on the ligands bipyrimidine and β -diketonates.



References

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