

Title: **Design, synthesis and study of heterometallic lanthanide compounds using new bis- β -diketone ligands.**

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Coordination compounds containing lanthanides ions exhibit exceptional physical properties that arise from their electronic structure, which allows several technological applications such as quantum computing. In that sense, materials with more than one type of lanthanide ions are very interesting, since they can enhance such type of properties.

The introduction of two different lanthanide ions in the same molecular system is, however, challenging due to the similar reactivity of lanthanides. To attain this problem a ligand-based strategy is performed where a molecular system with different coordination environments can produce heterometallic entities, differentiating the lanthanide ions by the size of their ionic radii.

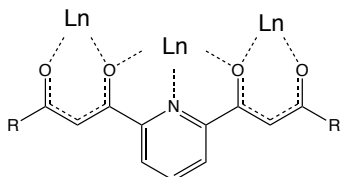


Figure 1. Representation of the bis β -diketone and dipicolinate chelating units

In this research project, a series of ligands based on bis β -diketone and dipicolinate as chelating units (shown in Figure 1) have been synthesized to explore and study the production of complexes featuring one or more than one type of lanthanide ion. The reactions have been carried out in different solvents with different methods of crystallization.

Keywords: Lanthanide, heterometallic, coordination complex, homoleptic, chelation, β -diketone, dipicolinate, quantum computing.