*Title:* **Synthesis and structural study of 1-D lanthanide complex**

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*Date:* 7 January

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Previously, GMMF researchers found a way to synthesize a 1-D polymer of dysprosium, that had SMM properties. The objective of this work is to reproduce and optimize the reaction of the previous work. Another objective is to analyze the different structures from the results obtained from X-ray diffraction. Finally, to obtain data on the magnetic properties of the compounds obtained. Different lanthanides have been used, such as Dy, Gd, Tb and Y. Various ligands such as hmp, chp, SALOH and benzoic acid have been used. These combinations have given a series of compounds, of which we have analyzed 6 complexes, 3 of them are the structure we had looked for ($[NaLn_2(SALOH)_5(chp)_2(CH_3COO)_2]$, (**1**),(**3**),(**6**)) and other three have resulted in new structures of 1D complexes ($[NaGd(SALOH)_2(CH_3COO)_2(MeOH)_2(CH_3CN)]$, $[NaCe_2(SALOH)_3(MeOH)_3(CH_3COO)_4(OH)_3(CH_3CN)]$, (**2**),(**4**)) and one molecular species ($[Gd_2(hmp)_2(C_6H_5COO)_6]$, (**5**)).

Finally, only the magnetic properties of the gadolinium complex (**2**) could be obtained during the time of the TFG.

**Keywords**: Single-molecule magnets, Lanthanide complex,1-D polymer, magnetic properties.