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Synthesis, characterization and photophysical study coordination compounds involving 4,4-sulfonydibenzoic acid and $Eu^{3+}$and Tb^{3+} ions

Maria E. T. Lima[1*] (PG), Douglas F. Franco[2] (PQ), Lippy F. Marques[3] (PQ), Charlane C. Correa[1] (PQ)

[1]*Department of Chemistry, Federal University of Juiz de Fora, Juiz de Fora, Brazil.*
[2] *Departament of Analytical Chemistry, physic-chemical and inorganic, Paulista State University Julio Mesquita Filho, Araraquara, Brazil.*
[3] *Institute of Chemistry, State University of Rio de Janeiro, Rio de Janeiro, Brazil.*
**E-mail: mariaeduardalima82@hotmail.com*

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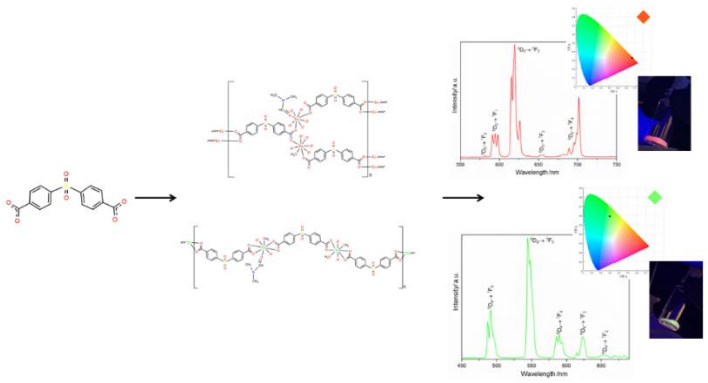
Lanthanide compounds have recently gained prominence due to their diverse applications[1]. In this work, four new polycrystalline coordination compounds containing Eu^{3+} and Tb^{3+} ions and the ligand 4,4'-sulfonyldibenzoic acid (sdb) have been synthesized. These compounds were characterized by infrared spectroscopy (IV), elementary analysis (CHN), thermogravimetric analysis (TG) and powder X-ray diffraction (DRXP). Furthermore, DRXP revealed that the compounds containing Tb^{3+} and Eu^{3+} ions are not isostructural. Based on these techniques, the structures of the obtained compounds were proposed. The photophysical study was performed by obtaining emission and excitation spectra, as well as decay curves and specific lifetimes for each compound. From the emission spectra of the Eu^{3+} compounds, the experimental quantum efficiency, the radiative and non-radiative decay rates, and the experimental Judd-Ofelt intensity parameters (Ω_2 and Ω_4) were determined.



Scheme 1. Proposed structure for the compounds, emission spectra and chromaticity diagram of two compounds obtained.

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References

[1] GALAÇO, Ayla R B S; LIMA, Juliana F; SERRA, Osvaldo A. Química Nova. **41**, 678–690 (2018).