XXI Brazilian Meeting on Inorganic Chemistry
X Brazilian Meeting on Rare Earths
III Workshop on Theoretical Bioinorganic Chemistry
Belo Horizonte, September 12 - 15th 2024

Oxadiazole ligand derived from 2-(4-hydroxy-azobenzene)benzoic acid: towards lanthanides and transition metal complexes.

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Thematic Area: Rare Earths

Keywords: Luminescence, Lanthanide, Oxadiazole

Coordination compounds have extensive applications from antitumor agents to Organic Light Emitting Diodes (OLEDs). In the last decades, the study and development of OLEDs have increased considerably due to their advantages compared to conventional Light Emitting Diodes (LEDs), such as flexibility, less energy consumption, and higher image definition. The use of Rare Earth or closed shell metals in the manufacturing of these devices is very attractive since lanthanides show sharp emissions as a result of their blocked *f-f* orbitals, and metals with d^0 or d^{10} configuration, such as Al^{3+} and Zn^{2+}, can increase quantum yield due to the stabilization of the singlet excited state or decreasing the possibility of non-radiative decays by vibrations or rotations of the organic ligand functional groups,. For instance, Europium(III) and Terbium(III) are commonly used in luminescent devices in order to achieve the emission of red (613 nm) and green (545 nm) color, respectively. Because of their low molar absorption coefficients, the lanthanide ions only show emission when coordinated to ligands. The luminescence process for Tb^{3+} and Eu^{3+} is well established and described by the Jablonski Diagram. When excited, the electron is promoted from the ground singlet state (S_0) to the excited singlet state (S_1) and subsequently transferred to the excited triplet state (T_1) in an ISC (Internal System Crossing). Later, by the Antenna Effect[1,2,] the energy is transferred to the excited triplet state of the metal ($^5D_0$ for Eu^{3+} and $^5D_4$ for Tb^{3+}), leading to the respective radiative decays of each metal. Initially, the Fisher esterification of the carboxylic acid resulted in the NMR mixture of E and Z products. The hydrazide formation was performed with hydrazine, and the cycloaddition was performed with 4-fluor-benzoyl chloride. Later, the organic ligand will be coordinated with Eu^{3+}, Tb^{3+}, and Al^{3+} e $Zn^{2+,}$ and the luminescence properties will be evaluated.

Acknowledgments: This work was carried out with the support of the Coordination for the Improvement of Higher Education Personnel-Brazil (CAPES)-Funding Code 001. Thanks to FAPESP for supporting the research.

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