Short Term Scientific Mission funded by the COST Action CA22131

Supramolecular LUminescent Chemosensors for Environmental Security

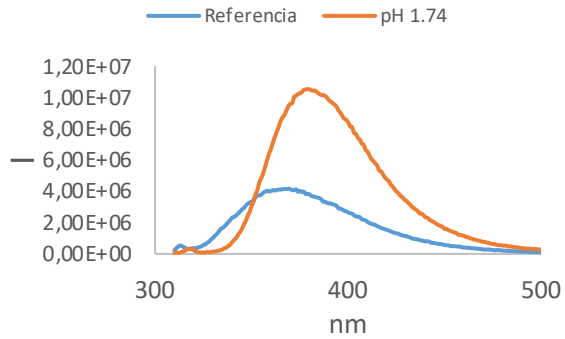
Structural and photophysical properties of polyaminic ligands containing pyridoxal moieties.

Aim of the project

This project aims to address the growing concern of heavy metal pollution, which negatively impacts the health. Ions such as Cd^{2+}, Pb^{2+}, and Hg^{2+} are known to cause toxic effects. Additionally, the toxicity of other metals and metalloids, like uranium, will also be studied.
The main goal is to develop chemosensors and nanosensors that can selectively detect toxic metal species. Two pyridoxal-polyamine derivatives will be evaluated, leveraging their luminescent properties to recognize and detect these harmful environmental species.

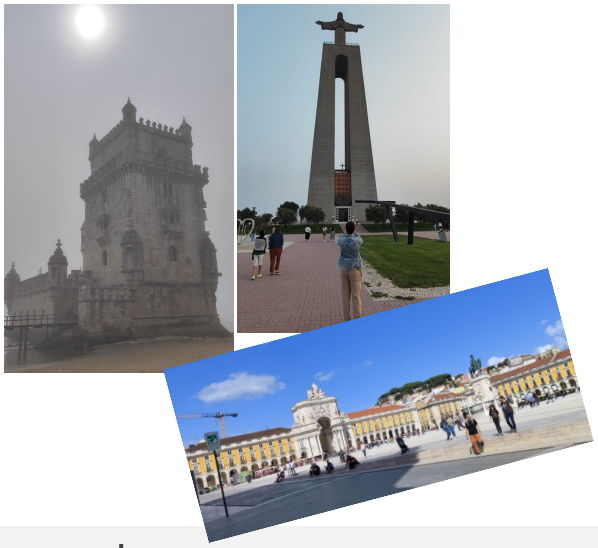
Results

The protonation states of both ligands were carefully studied, revealing the presence of a previously unidentified species, later confirmed to result from ligand aggregation through additional absorbance and solvent tests. Quantum yields for each protonation state were determined, and fluorescence lifetime measurements were conducted for both ligands and their interactions with heavy metals (Hg^{2+} and UO_2^{2+}), highlighting their potential as sensors.
The study successfully achieved its objectives, providing new insights into ligand behavior and confirming their suitability for heavy metal detection, with promising results for future research and collaborations.



$$\Phi_M = \Phi_R \cdot \frac{I_{M(1-10^{-AR})}}{I_{R(1-10^{-AM})}} \frac{n_M^2}{n_R^2}$$

Φ_M
0.0065656



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Period: 17.09.2024 to 18.10.2024

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Funded by the European Union