

CYCLE DE CONFÉRENCES DE CHIMIE

Avec le concours de : Université Clermont Auvergne
INP Clermont Auvergne

Jeudi 19 mars à 15 h

Amphi Rémi (site des Cézeaux)

Hors cycle

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Ln(III)-centered chiroptical activity from coordination compounds and inorganic matrices

Circularly Polarized Luminescence (CPL) is gaining increasing interest in materials chemistry and physics thanks to the broad range of possible biological^[1] and technological applications,^[2] including the design of chiroptical phosphors for CPL-microscopy^[3] and for CPL security devices or inks.^[4] CPL activity in the visible spectral region, stemming from trivalent lanthanide ions, is usually obtained in the case of luminescent Ln(III) complexes [Ln = Tb (in the green) and Eu (in the red)] containing a non-racemic chiral ligand, but it can also be detected when these ions are embedded in inorganic matrices crystallizing in enantiomorphic space groups.^[5,6] In this contribution, two examples of CPL active Ln(III)-based species are presented, the former related to Ln(III) complexes and the latter to enantiomorphic inorganic matrices capped with organic ligands to sensitize the Ln(III) luminescence (Figure 1). Both these materials can be considered good candidates for advanced chiroptical applications.

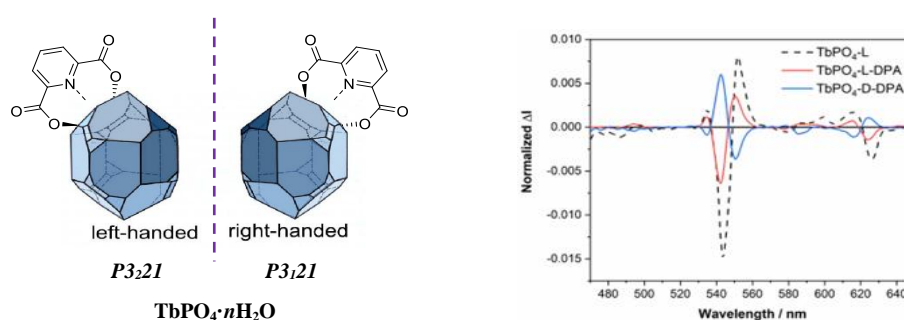


Figure 1: *TbPO₄ nanocrystals capped with dipicolinic acid and related circularly polarized luminescence spectra*

- [1] A.T. Frawley, R. Pal, D. Parker, *Chem. Commun.* **2016**, 52, 13349-13352.
 [2] F. Zinna, M. Pasini, F. Galeotti, C. Botta, L. Di Bari, U. Giovannella, *Adv. Funct. Mater.* **2017**, 27, 1603719.
 [3] P. Stachelek, L.E. MacKenzie, D. Parker, R. Pal, *Nat. Commun.* **2022**, 13, 553.
 [4] L.E. MacKenzie, R. Pal, *Nat. Rev. Chem.* **2021**, 5, 109-124.
 [5] U. Hananel, A. Ben-Moshe, H. Diamant, G. Markovich, *Proc. Natl. Acad. Sci. U.S.A.* **2019**, 116, 11159-11164.
 [6] L. Ceccon, E. Cavalli, S. Ruggieri, M. Bettinelli, F. Piccinelli, *Inorg. Chem.* **2024**, 63, 13636-13643.

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