Photochemistry School 2020

September 7-9

Book of Abstracts

Designed by Freepik

WWW.PHOTOCHEM2020.COM

Synthesis of gold(I) complexes with group 14 elements and study of their properties

A. Sorroche,[1] J. M. López-de-Luzuriaga,[1] M. Monge,[1] M. E. Olmos,[1] M. Rodríguez-Castillo[1]

[1] Departamento de Química, Universidad de La Rioja, Centro de Investigación en Síntesis Química (CISQ), Complejo Científico-Tecnológico, 26004, Logroño, Spain. alba.sorroche@alum.unirioja.es

The synthesis of organometallic compounds that present Au(I)···M metallophilic interactions (M = closed shell metal ions) is of great interest from both theoretical and experimental points of view. The presence of this type of interactions in such compounds is, in a large number of cases, responsible for the existence of luminescent properties. Although it might seem that the most common metallophilic interactions between Au(I) centres would be those that involve group 11 centres, there is an increasing interest in other new metallic centres such as those of group 14: Ge(II)[1], Sn(II)[2] or Pb(II)[3].

In this work we have focused on the synthesis of coordination compounds bearing Au(I)-Sn(II) bonds, less explored than other metallophilic interactions, on the study of the nature of these interactions, and on their photophysical properties. As a main synthetic strategy, we have used the insertion of $SnCl_2$ groups in the Au-Cl bond of the gold precursor [AuCl(tht)] (tht = tetrahydrothiophene) in the presence of different types of phosphines, depending on the photophysical properties sought. In general, this type of reactions provides tetra- or tricoordinated gold(I) compounds that present interesting properties like dual phosphorescence or mechanochromic behaviour. To complete this work, a computational study has been carried out at DFT and TD-DFT level, to explain the origin of luminescent emissions and the factors that affect their energy.

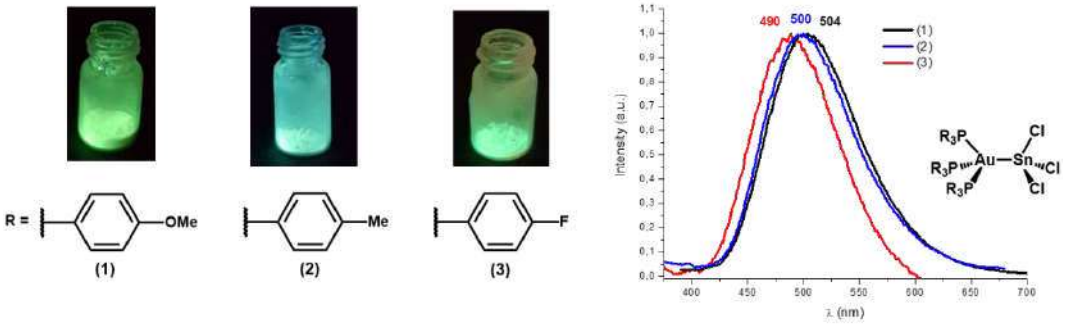

Figure 1. Luminiscence of 1-3 compounds with different donor-aceptor ligands.

Acknowledgements: We thank D.G.I. MINECO/FEDER (project number PID2019-104379RB-C22 (AEI/FEDER, UE)).

[1] R.V. Bojan, J. M. López-de-Luzuriaga, M. Monge, M. E. Olmos, R. Echevarría, O. Lehtonen, D. Sundholm, *ChemPlusChem.*, **2016**, *81*, 176-186.
[2] R.V. Bojan, J. M. López-de-Luzuriaga, M. Monge, M. E. Olmos, R. Echevarría, O. Lehtonen, D. Sundholm, *ChemPlusChem.*, **2014**, *79*, 67-76.
[3] R. Echevarría, J. M. López-de-Luzuriaga, M. Monge, S. Moreno, M. E. Olmos, *Inorg.Chem.*, **2016**, 55, 10523-10534.