



PhotOnline'2023

SP₂P web-conference organized by and for young researchers – 2nd edition

1-2
February
2023



Programme and book of abstracts

Poster 03

SYNTHESIS OF PHOSPHORESCENT CYCLOMETALATED Ir(III) COMPLEXES WITH ISOCYANIDE AND ACETYLIDE LIGANDS.

Andrea Corral*, Mónica Martínez, Elena Lalinde, M^a Teresa Moreno

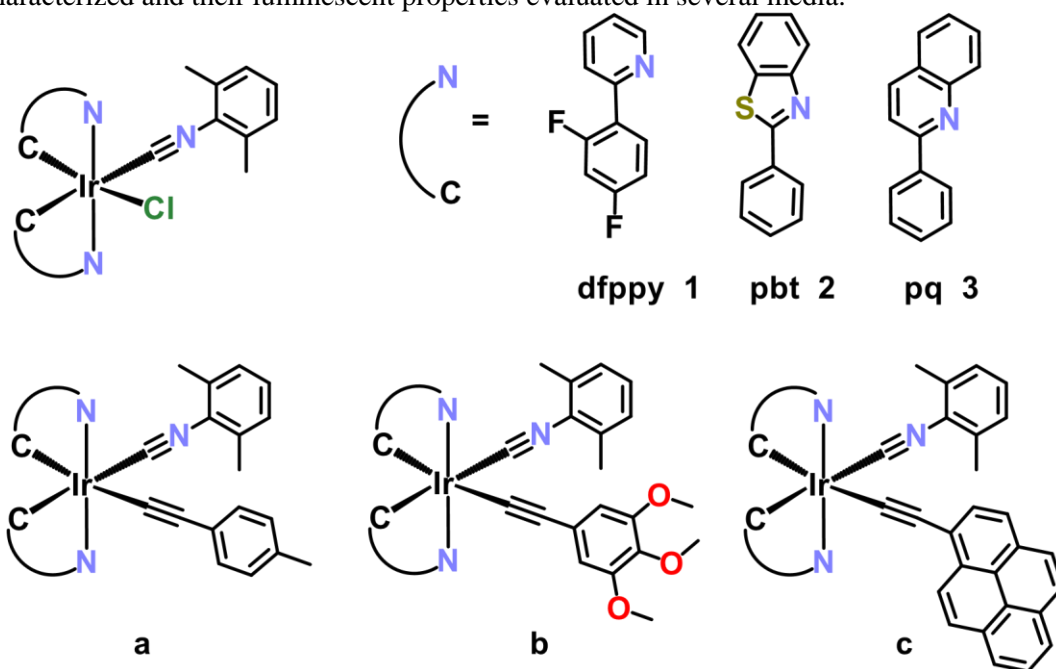
Departamento de Química-Centro de Investigación en Síntesis Química (CISQ), Universidad de La Rioja, 26006, Logroño, Spain

E-mail: ancorrz@unirioja.es

Keywords: Phosphorescence, Iridium(III) complexes, Cyclometalated, Isocyanide, Acetylide

Over the last few decades, luminescent d⁸ Pt(II) and d⁶ Ir(III) metal complexes have received expanding interest due to their potential application for optoelectronic fields. In particular, cyclometalated Ir(III) complexes display very high photophysical performances due their good photostability, high photoluminescent quantum yields (Φ_{PL}), facile color tunability and long-lived triplet excited states. As a result of such properties, these complexes are used in different files of applications such as phosphorescent dopants in organic light-emitting diodes (OLEDs), lightemitting electrochemical cells (LEECs), solar cells (DSSCs- dye-sensitized solar cells), multifunctional devices (OLETs -organic light-emitting transistors) and photoredox catalysis^[1]. These complexes usually display mixed metal-to-ligand charge transfer/ligand centered (³MLCT/³LC) excited states with some ligand-to-ligand charge transfer (³LLCT) character depending on the auxiliary ligands. In this context, the coordination of strong field ligands such as CN⁻, isocyanide or acetylide is desirable because they rise the energy of the *dd* metal centered causing enhancement of the quantum yields.

Following our interest aiming in designing photoluminescent complexes featuring isocyanide and/or acetylide ligands^[2, 3], here we present the synthesis of a new family of iridium cyclometalated heteroleptic complexes [Ir(C[^]N)₂(CNXyl)(C[^]CR)] (R= *p*-tolyl **a**; C₆H₂(OMe)₃ **b**; pyrene **c**), which have been synthesized using the corresponding chloride/CNXyl complexes [Ir(C[^]N)₂Cl(CNXyl)] [C[^]N = difluorophenylpyridinate (dffpy) **1**; 2phenylbenzothiazolate (pbt) **2**; 2-phenylquinolate (pq) **3**] and (AgC[^]CR)_x as precursors. All complexes have been fully characterized and their luminescent properties evaluated in several media.



[1] Feng, Z.; Sun, Y.; Yang, X.; Zhou, G. *Chem. Rec.* **2019**, *19*, 1710-1728.

[2] Fernández-Cestau, J.; Giménez, N.; Lalinde, E.; Montaña, P.; Moreno, M. T.; Sánchez, S. *Organometallics* **2015**, *34*, 1766-1778. [3] Martínez-Junquera, M.; Lara, R.; Lalinde, E.; Moreno, M. T. *J. Mater. Chem. C* **2020**, *8*, 7221-7233