

TUNABLE PHOSPHORESCENCE VIA THE STRUCTURE DESIGN OF CYCLOMETALATED Pt(II) COMPLEXES

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Organic light-emitting diodes (OLEDs) have gained a lot of attention as effective candidates for flat panel display technologies and solid-state lighting due to a number of following advantages such as: small size, flexibility, brightness, fast response time and superior viewing angle.^[1,2] Phosphorescent heavy-metal complexes, such as iridium(III) and platinum(II) complexes with strong spin-orbit coupling are able to efficiently harvest both singlet and triplet electro-generated excitons, thus opening the possibility to achieve theoretically 100% internal quantum efficiency in such devices.^[3] Cyclometalated platinum(II) complexes have attracted a lot of interest because of their interesting coordination geometry and rich photochemical and physical properties, which make them useful as efficient phosphorescent materials for fabrication of OLEDs.^[4] Pt(II) metal center are four-coordinated that can accommodate bidentate, tridentate, or tetradentate chelating ligands, with ancillary ligands where necessary, that allows considerable flexibility in engineering a desired complex for application as light emitting materials in OLEDs.^[5] It is easy to alter electronic structures and photophysical properties of platinum complexes by modification of the coordinated ligands.^[6] In this communication, we will describe the synthesis of the new series of phosphorescent cyclometalated platinum(II) complexes, containing C[^]N[^]N^[7] and N[^]C[^]N^[8] tridentate and C[^]N^[9] bidentate coordinating ligands, based on diazines. An appropriate functionalization of the cyclometalated ligand and the choice of the ancillary ligand, allow to tune the photophysical and electrochemical properties of these complexes. The influence of various structural modification on photophysical properties had been thoroughly studied and structure properties relationships were highlighted.

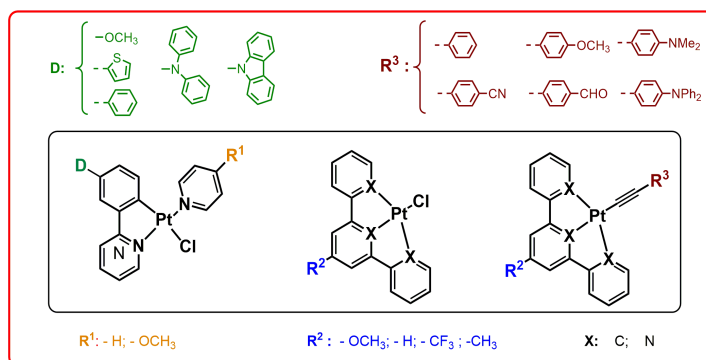


Figure 1. Chemical structures of the investigated tridentate C[^]N[^]N, N[^]C[^]N and bidentate C[^]N cyclometalated Pt(II) complexes.

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