



Synthesis of luminescent copper (I) complexes bearing NHC-Phosphine ligands

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Nowadays organometallics complexes are widely applied for lighting fields as organic light-emitting diodes (OLEDs) or light-emitting electrochemical cells (LECs).¹ For many years transition metals such as ruthenium, iridium, gold...² were mainly used for this application because of their ability to enable emission from triplet excitons, but their low abundance and high price are important issues. In this context, we put our focus on copper(I) complexes which are more convenient and can also provide efficient photo- and electro-luminescence by organic thermally activated delayed fluorescence (TADF).³



In this work, we have described a new family of copper (I) complexes with general formula of $[\text{Cu}(\text{NHC-PR}_2)(\text{N}^{\wedge}\text{N})]\text{PF}_6$, in which NHC is a N-Heterocyclic Carbene tethered to phosphine moiety combined with di-nitrogenated ligands. We have studied their photoluminescence properties in solid state (powder). The additional coordination of the phosphine moiety onto the copper metal centre offered a complementary design to cover the leak of emission in the visible region compared to the previous three coordinated copper complexes of general formula $[\text{Cu}(\text{NHC})(\text{N}^{\wedge}\text{N})]\text{PF}_6$.⁴

References

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