Chiral Luminescence Emitters based on Bicarbazole for Circularly Polarized Organic Emitting Diodes

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Chiral molecules are capable of emitting spontaneously circularly polarized (CP) light, opposite in sign (either left- or right-CP luminescence, CPL) for the two enantiomers.[1] Such specific feature have made chiral emitters particularly appealing for the development of organic light emitting diodes (OLEDs) with CP electroluminescence (CP-OLEDs), which has recently emerged as an interesting approach to improve displays performances in comparison to currently used unpolarized OLEDs.[2] CP-emitters with thermally activated delayed fluorescence (TADF) have recently attracted significant attention owing to the possibility to simultaneously combine the use of both singlet and triplet excitons conversion for high devices efficiency, and a circularly polarized light emission.[3] In this presentation, I will show our last results regarding the design of chiral TADF emitters based on either a covalent donor-acceptor approach or through the development of luminescent chiral exciplexes (figure 1).

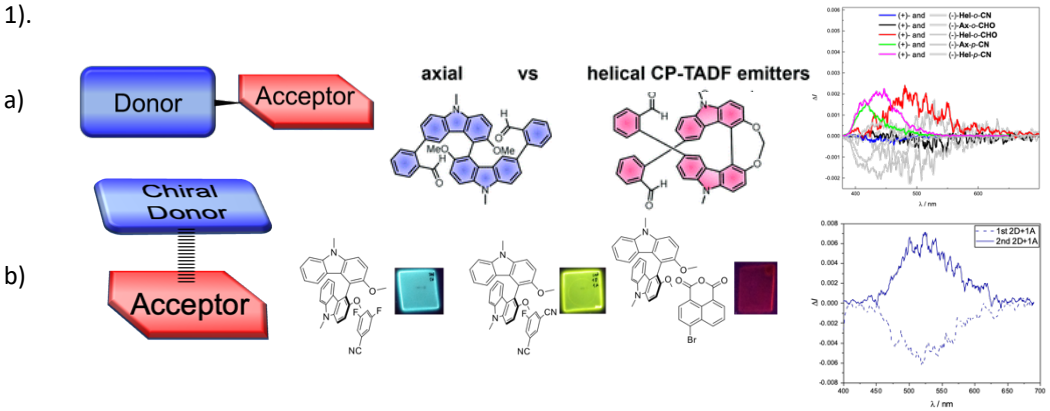

Figure 1. a) Axial and helical bicarbazole donor-acceptor molecular systems and CPL spectra in toluene (M^{-5}) and b) Chiral TADF exciplexes with pictures of their solid-state emissions and CPL spectra of donor and 3-fluorophthalonirile in neat film.

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