From Frustrated Ligands Towards Thermally Activated Delayed Fluorescence

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Intramolecular frustrated Lewis pairs (FLP) recently gained an intense interest due to their ability to activate small molecules (e.g. CO, NO, SO_2 etc.) [1]. Especially the reversible activation of H_2 had raised the number of metal-free protocols for catalytic hydrogenations using FLPs [2]. Since they bear a donor center (Lewis base) and an acceptor center (Lewis acid) which are spatially separated, intramolecular FLPs could be utilized as a suitable ligand-framework for metal centers [3]. With such a new class of transition-metal complexes we target thermally activated delayed fluorescence (TADF) – as a donor/acceptor interplay in the emitter molecules is known to decrease the T_1 - S_1 energy difference and therefore enhance the reverse intersystem crossing (RISC) [4]. Hence, our group synthesized and photophysically investigated a series of Au(I) complexes bearing a P/B-FLP and an aryl or an alkyne as ancillary ligand. By altering the donor/acceptor ability of the ancillary ligand we tend to tune the ratio between prompt (prompt fluorescence or phosphorescence) and delayed (TADF) emissions.

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