

RECENT PROGRESS OF AZAINDOLO[3,2,1-*jk*]CARBAZOLE BASED DONOR-ACCEPTOR MATERIALS AS POTENTIAL TADF EMITTERS

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Latest investigation in our group concerned the introduction of novel bipolar host materials, based on oxadiazole electron acceptors and planarized triarylamine donors for Phosphorescent Organic Light Emitting Diodes (PhOLEDs).^[1] We could show, that *via* an increase of the planarization of triarylamine, a decreasing planarization of the donor strength evolves. We observed an increase of the acceptor strength by the introduction of electron withdrawing nitrogen atoms in the ICz scaffold. As both HOMO and LUMO levels were lowered, high triplet energies could be conserved.^{[1],[2]}

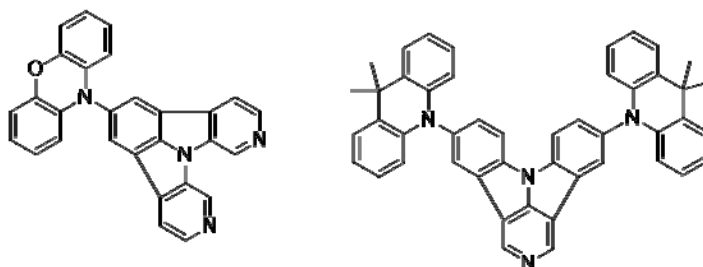


Figure 2: Examples for different potential bipolar potential TADF-Emitters

Currently the aim of our work is the synthesis of novel acceptor-donor systems as potential Thermally Activated Delayed Fluorescence (TADF) emitter for OLEDs. Calculations for several bipolar systems using N-incorporated ICz acceptors with different amounts and varying its position showed promising electroluminescent properties. In course of this contribution an insight of different synthetic approaches achieving donors, acceptors and bipolar systems, will be given and results of photophysical and electrochemical characterization will be discussed.

[1] P. Kautny *et al.*, "Oxadiazole based bipolar host materials employing planarized triarylamine donors for RGB PHOLEDs with low efficiency roll-off", *J. Mater. Chem. C.*, vol. 2, pp 2069-2081, (2014)

[2] T. Kader *et al.*, "Azaindolo[3,2,1-*jk*]carbazoles: New Building Blocks for Functional Organic Materials", *Chem. – Eur. J.*, vol. 25, pp. 4412–4425, (2019)