PLANARIZED PYRIDINE-BASED TRIARYLAMINES FOR FUNCTIONAL ORGANIC MATERIALS

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Arylamines are commonly used as electron donating building blocks in functional organic materials. Our research group investigated planarization of arylamines as tool to control the donor strength, as increasing planarization leads to a decrease of donor strength. Additionally, fully planarized indolo[3,2,1-*jk*]carbazole (ICz) exhibited also weak acceptor character [1]. Based on these results, we aimed to incorporate pyridine-like nitrogen atoms into the ICz scaffold, to further increase the acceptor strength. We developed a comprehensive synthetic strategy for the synthesis of all six possible mono, as well as six different double substituted nitrogen incorporated ICz isomers [2]. Characterization revealed that not only the amount of nitrogen, but especially its position within the scaffold decisively impacts the photophysical and electrochemical properties. Hence, targeted positioning of the nitrogen atoms allows to fine-tune the materials properties. Additionally, the pyridine nitrogens influence intermolecular hydrogen bonding and therefore the alignment within the solid state [2, 3]. Beside the synthetic approaches and the structure-property relationships of the new building blocks, first application in bipolar materials will be presented within this contribution.

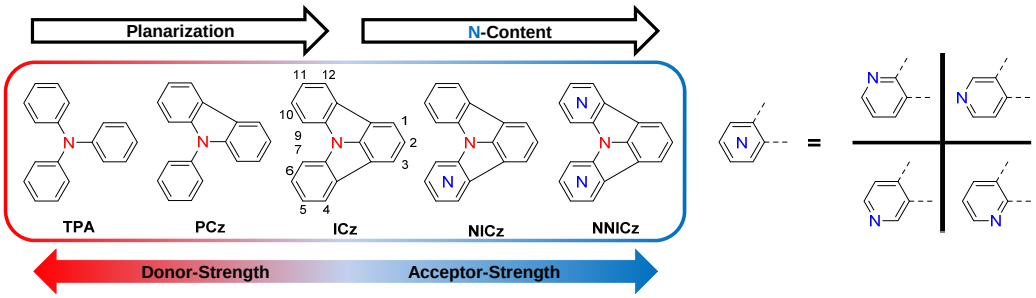

Figure 1: Concept of donor- / acceptor-strength control by planarization and nitrogen incorporation [2].

[1] P. Kautny, D. Lumpi, Y. Wang, A. Tissot, J. Bintinger, E. Horkel, B. Stöger, C. Hametner, H. Hagemann, D. Ma, and J. Fröhlich, *J. Mater. Chem. C.* 2014, 2, 2069-2081.

[2] T. Kader, B. Stöger, J. Fröhlich, and P. Kautny, *Chem. Eur. J.* 2019, 25, 4412-4425.

[3] T. Kader, B. Stöger, J. Fröhlich, and P. Kautny, *Acta Cryst.* 2019, B75, 97-106.