Novel Building Blocks for Optoelectronics

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In a broad field of organic optoelectronics, scientists are looking for particularly electron-rich and electron-deficient building blocks. Their combination has a tendency to lead to better performance in such areas as organic field effect transistors, organic photovoltaics and fluorescence imaging. The lecture will focus on presentation of new fluorophores and the narrative will navigate from synthesis to photophysical properties. Special emphasis will be put on explaining the relationship between the structure and the strength of fluorescence.

Recently we have discovered and optimized the first practical synthesis of non-fused pyrrole[3,2-*b*]pyrroles *via* domino reaction of aldehydes, primary amines, and butane-2,3-dione.[1-3] These dyes possess superb optical properties (including strong violet, blue or green fluorescence both in solution as well as in the solid state), and new synthetic methodology brought these molecules from virtual non-existence to the intensively investigated area functional π-systems. Recently, we have proved that the dipyrrolonaphthyridinedione (DPND) core constitutes an excellent scaffold for the design of strongly fluorescent dyes or quadrupolar-type materials with large two-photon absorption (TPA) cross-sections (up to 5,180 GM).

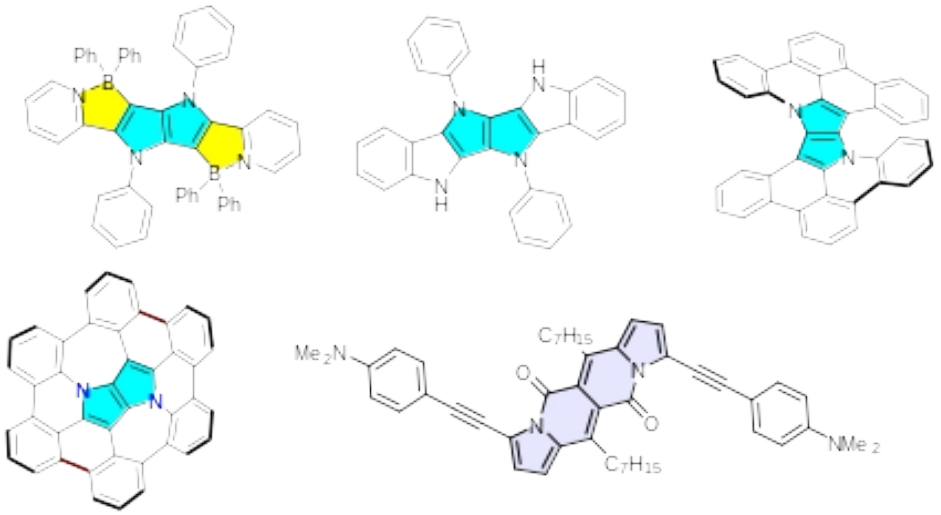

Figure 1. Exemplary architectures based on pyrrolo[3,2-*b*]pyrrole and DPND cores.

References

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