SYNTHESIS AND INVESTIGATION OF ORGANIC SEMICONDUCTORS FOR TADF OLEDs

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Over the years organic light-emitting diodes (OLEDs) have shown a wide variety of excellent properties, such as energy consumption, flexibility, light weight etc. Therefore, they have become a highly promising technology for flat panel displays [1]. Seeing that first-generation materials for OLEDs are fluorescent and have greatly limited efficiency up to 25% [2] and on the other hand second-generation OLEDs use phosphorescent materials that can achieve almost 100% but require expensive heavy metals such as platinum and iridium [3]. In response to these issues the search for efficient and cheap luminescent materials lead to purely organic materials with thermally activated delayed fluorescence (TADF) [4]. OLEDs based on such emitters enable the possibility to harvest both triplet and singlet excitons, duo to very low energy gap (ΔE_{ST}), theoretically granting internal quantum efficiencies of up to 100% of the devices [5].

In this work synthesized compounds and their thermal, electrochemical, photophysical, electrochemical, photoelectrical properties as well as device characterization is going to be presented.

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