

SYNTHESIS AND INVESTIGATION OF BENZIMIDAZOLE/*tert*-BUTYLCARBAZOLE HYBRID BIPOLAR MATERIALS FOR HIGHLY EFFICIENT OLEDs

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Organic light emitting diodes (OLEDs) have been a widely studied subject for past two decades and have become a staple field of research in nowadays optoelectronic technology. Despite of its high potential, OLED technology remains only partly commercialized, mainly due to short lifespan of blue OLEDs [1]. In order to achieve high efficiency in OLEDs triplet-triplet annihilation, a phenomenon accruing between phosphorescent emitters, is to be abstained from. A host matrix is needed to isolate emitters. Such host matrix materials need to meet certain prerequisites: high triplet energy, appropriate energy level complementation, appropriate charge transfer properties and high thermal stability are paramount [2].

Recently, new benzimidazole/carbazole compounds were reported, showing excellent thermal stability, and high efficiency in different color OLEDs (up to 27% external quantum yield) [3].

In this work, five new benzimidazole/*tert*-butylcarbazole compounds were synthesized and their photophysical, electrochemical and thermal properties as well as device characterization studied.

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[3] Jau-Jiun Huang, Yu-Hsiang Hung Orthogonally Substituted Benzimidazole-Carbazole Benzene As Universal Hosts for Phosphorescent Organic Light-Emitting Diodes, *Org. Lett.* 2016, 18, 4, 672-675