

Aminocarbazoles for High Efficiency Green PhOLEDs: 1,8-Diphenylaminocarbazoles as Solution Processable Host Materials for Phosphorescent OLEDs

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A series of novel carbazole-based materials, **DPACz1**, **DPACz2** and **DPACz3** having diphenylamino moieties at 1- and 8- positions of carbazole have been synthesized and characterized for the first time. The structures of the final products were confirmed by $^1\text{HNMR}$, $^{13}\text{CNMR}$ and HRMS measurements. Based upon excellent solubility, film forming properties and high triplet energies (2.68, 2.60 and 2.45 eV) of the materials, they have been used as host materials for high efficiency solution processed green phosphorescent organic light emitting diodes (PhOLEDs) with the device configuration, ITO / PEDOT:PSS / Emitting layer / TPBi / CsF / Al. The devices show high luminous and power efficiencies up to 25.0 cdA^{-1} and 17.9 lmW^{-1} , respectively. Luminous efficiency is further improved up to 26.7 cdA^{-1} by doping with the common electron transporting material PBD. Turn on voltage as low as 3.1 was observed at 10 cdm^{-2} .