



## Synthesis and Photophysical Characterization of Novel Triphenylamine-benzimidazole Derivatives

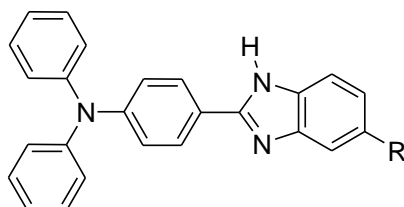
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Research on organic luminescent materials has been intensely pursued due to their importance in technological applications related to signaling, fluorescent biosensory/chemosensory materials, molecular switches and organic light emitting diodes (OLEDs). Organic fluorophores such as triphenylamine and benzimidazole derivatives have attracted a particular attention owing to their high emission efficiency being widely used as electron transporters and emitting layers for OLEDs.<sup>1</sup>

Recently, we have been investigating the potential of heterocyclic systems bearing functionalized (benz)imidazole derivatives exhibiting high thermal stability, interesting emissive and chemosensory properties.<sup>2</sup> In this communication we report the synthesis and photophysical characterization of triphenylamine-benzimidazoles (compounds **1a-d**) which were synthesized by a one step reaction through the Na<sub>2</sub>S<sub>2</sub>O<sub>4</sub> reduction of several commercially available *o*-nitroanilines in the presence of triphenylamine aldehyde in DMSO at 120 °C. Compounds **1a-d** bear different functionalization at position 5 of the benzimidazole with electron-donor or acceptor groups (**Figure 1**). A comprehensive spectral and photophysical investigation of these compounds including absorption, fluorescence and triplet-triplet absorption spectra, together with quantum yields of fluorescence, internal conversion, intersystem crossing and singlet oxygen and rate constants for the radiative and radiationless processes has been undertaken in solution at room temperature. It is shown that compounds **1a-d** exhibit high fluorescence quantum yields ( $\phi_F = 0.70$ -0.78). Additionally, a comparison between the optical and photophysical properties of **1a-d** will be also presented and discussed.



**1a** R = H

**1b** R = OH

**1c** R = OMe

**1d** R = CN

**Figure 1:** Structure of triphenylamine-benzimidazoles **1a-d**.

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### References:

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