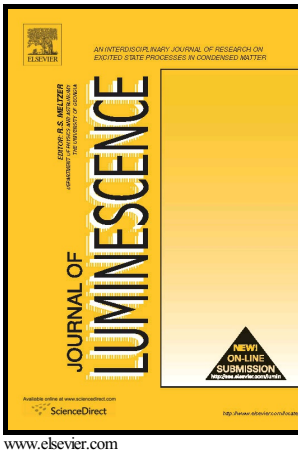

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High-Triplet-Energy Carbazole and Fluorene Tetrads

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Abstract

A series of twisted-structure carbazole-fluorene tetrads featuring 3,3'-bicarbazole core decorated with singly-bonded carbazole and fluorene end-linkers were synthesized and studied as potential host materials. The tetrads inferred high glass transition temperature (up to 105 °C) and good film-forming properties, which contributed in attaining large hole drift mobilities (up to 10^{-3} $cm^2/V/s$) in the solution-processed amorphous films. The revealed high triplet energies (up to 2.9 eV) indicated their potential to be utilized as hosts in blue light-emitting devices. Greater sensitivity of the triplet energies to the linking position of peripheral moieties as compared to the sensitivity of the singlets implied new possibilities for the independent tuning of these energies in carbazole-fluorene tetrads.

Key words: high-triplet-energy hosts, carbazole, fluorene, phosphorescence, carrier drift mobility

1 Introduction

Leading light-emitting-device technologies employ low-molecular-weight multifunctional compounds, which provide by far better purity as compared to that of polymers and easier ways to optimize chemical, photophysical and electrical properties via rational functionalization [1–4]. Furthermore, the formation of small-molecule compound layers possesses an advantage of