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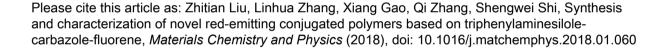
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ACCEPTED MANUSCRIPT

Synthesis and Characterization of Novel Red-Emitting Conjugated Polymers Based on Triphenylaminesilole-Carbazole-Fluorene

Zhitian Liu^{1, 2}*, Linhua Zhang¹, Xiang Gao^{1, *}, Qi Zhang¹, Shengwei Shi¹

Abstract A series of novel red-emitting conjugated polymers were synthesized, adopting host-guest technique, with fluorene-carbazole backbone and low bandgap guest unit, 1,1-dimethyl-3,4-di(triphenylamine)-2,5-dithienyl)silole, the chromophore. Those materials were well characterized by nuclear magnetic resonance, elemental analysis, absorption and fluorescence spectra, and cyclic voltammetry. The HOMO energy levels of these three copolymers locate within the range of -5.40~-5.33 eV which are greatly elevated compared with that of polyfluorene and match the work funtions of ITO and ITO/PEDOT:PSS (about 4.7 eV and 5.0 eV, respectively) better, indicating smaller hole-injection barrier. light-emitting diodes (PLED) with the configuration ITO/PEDOT:PSS(40 nm)/PFO-Cz-TPATST(80 nm)/CsF(1.5 nm)/Al(100 nm) and ITO/PEDOT:PSS(40 nm)/PFO-Cz-TPATST(80 nm)/1,3,5-tris(2-N-phenylbenzimidazolyl)benzene (TPBI) (30)nm)/CsF(1.5)nm)/Al(100 nm) were fabricated respectively. Highest luminous efficiency of 1.06 cd A⁻¹ was achieved.

Keywords 1,1-dimethyl-3,4-di(triphenylamine)-2,5-dithienyl)silole; red-emitting conjugated copolymers; PLED.

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