



材料合成及性能

含噻二唑聚芴类白光聚合物的合成与发光性能研究

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摘要：通过Suzuki偶联反应将2, 7-二溴-9, 9-二辛基芴 (Br-DOF)、2, 7-二硼酸-9, 9-二辛基芴 (B-DOF) 和4-(8-(2, 7-二溴-9-辛基芴) 辛氧基)-N-4-(7-(4-(二苯胺基) 苯基) 苯并噻二唑) 苯基-二苯胺 (Br-TAF) 共聚, 合成了白光聚合物 PDOF-TAF。以PDOF-TAF为发光层, 溶液旋涂制备了非掺杂型单层白光有机电致发光二极管, 色坐标为(0.23, 0.18)。通过插入电子传输层TPBI和空穴传输层PVK得到的白光器件发射光谱覆盖了410~700 nm区域, 色坐标从(0.23, 0.18)调整到(0.24, 0.32), 亮度达到2 020 cd/m², 电流效率达到1.4 cd/A。实验结果表明, PDOF-TAF是一种很好的白光聚合物发光材料, 在WOLED中将有很好的应用前景。

关键词：白光 芴 聚合物 白色有机电致发光

Synthesis and Luminescent Properties of Polyfluorene Containing Thiadiazole as White Light-emitting Polymer

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Abstract: Polyfluorene containing thiadiazole (PDOF-TAF) was synthesized by palladium-catalyzed Suzuki cross coupling reaction of 2,7-dibromo-9,9-dioctyl-9H-fluorene (Br-DOF), 9,9-dioctyl-9H-fluorene-2,7-diyldiboronic acid (B-DOF) and 4-(8-(2,7-dibromo-9-octyl-9H-fluorene-9-yl)octyloxy)-N-(4-(7-(4-(diphenylamino) phenyl)benzo[c][1,2,5]thiadiazol-4-yl)phenyl)-N-phenylaniline (Br-TAF). The synthesized polymer was applied as white light-emitting polymer and was used as the emitting layer to prepare the non-doped white organic light-emitting diodes (WOLED) by spin-coating. The color coordinates locate at (0.23, 0.18). By inserting 1,3,5-tris(1-phenyl-1H-benzimidazol-2-yl)benzene (TPBI) as electron transport layer and Poly(N-vinylcarbazole) (PVK) as hole transport layer, the emission spectra of the diode cover 410~700 nm visible region, and the color coordinates shift to (0.24, 0.32), locating close to the white point. In addition, the luminescence and current efficiency can reach up to 2 020 cd/m² and 1.4 cd/A, respectively, indicating that the synthesized polymer has highly potential application as the material of white light-emitting layer in WOLED.

Keywords: white emitter fluorene polymer WOLED

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