

研究论文

新型1,3,4-噁二唑衍生物的能带结构及其对器件性能的影响

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摘要 利用紫外-可见吸收光谱和电化学方法表征了三个系列新型的1,3,4-噁二唑类化合物的能级结构. 设计并制备了以噁二唑衍生物与MEH-PPV的共混物作为发光层的电致发光器件(LED), 比较了不同结构噁二唑引入发光层后对器件性能的影响. 研究表明, 以共混物为发光层的LED, 其最大亮度可达到11810 cd/m²(8.5 V), 最大流明效率为1.1 cd/A. 与纯MEH-PPV单层发光器件相比, 最大亮度提高了约40倍. 结果表明, 噁二唑类衍生物具有优良的电子传输特性, 将其引入发光层能有效地提高LED的性能.

关键词 [噁二唑衍生物](#) [电致发光](#) [电子传输性](#)

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Energy Levels of Novel 1,3,4-Oxadiazole Derivatives(OXD s) and Device Performance Using Blends of MEH-PPV and the OXDs as Emissive Layers

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Abstract The energy levels, band gaps of new oxadiazole derivatives with different lengths of a lkyl chain attached either lateral or terminal to the central phenylene ring were obtained based on the results of CV and UV-Vis spectroscopy. HOMO energy levels(-5.75—6.20 eV) of the a lkoxyl-substituted derivatives are much higher than that of the unsubstituted one, especially t he one with lateral alkoxy groups. In contrast, the LUMO energy levels are in the range of - 2.78—2.89 eV. The quasi-reversible redox behavior of the compounds indicates that they cou ld be used as an active material for a light-emitting device. The light-emitting device using ble nds of MEH-PPV and the derivatives as emissive layers with brightness up to 11810 cd/m²(8.5 V), 40 times brighter than that with MEH-PPV was fabricated. The result of the devices sugges ts that oxadiazole derivatives studied can be used as the electron-transporting materials and thus to enhance the efficiency of LEDs.

Key words [Oxadiazole derivative](#) [Electroluminescence](#) [Electron-transporting](#)

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