

研究论文

带烷氧基的苯基蒎烯吡啶铱配合物的合成及光物理性质

何鉴^{1,2}, 汪鹏飞¹, 刘红梅^{1,2}, 张晓宏

1. 中国科学院理化技术研究所纳米有机光电子实验室, 北京100080;
2. 中国科学院研究生院, 北京 100039

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摘要 合成了一组新型的带有烷氧基团的铱(III)配合物 $[\text{Ir}(\text{RO-ppy})_3]$, 并进行了结构表征. 该组配合物在~496 nm处有较强的三重态发射, 磷光量子产率为0.4~0.6, 三重态寿命为2~4 μs . 结果表明, 连接了长链的配合物可减少分子间的聚集, 可以用作有机电致发光器件中的磷光材料.

关键词 [铱\(III\)配合物](#) [三重态](#) [聚集](#) [磷光材料](#) [有机电致发光器件](#)

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Synthesis and Photophysical Properties of Tris(pinene-2-phenylpyridine) Iridium Complexes with Alkoxy Groups

HE Jian^{1,2}, WANG Peng-Fei¹, LIU Hong-Mei^{1,2}, ZHANG Xiao-Hong^{1*}

1. Nano-Organic Photoelectronic Laboratory, Technical Institute of Physics and Chemistry, Chinese Academy of Sciences, Beijing 100080, China;
2. Graduate University of Chinese Academy of Sciences, Beijing 100039, China

Abstract Heavy metal complexes as the highly efficient phosphorescent emitters in organic light emitting diodes(OLEDs) have been extensively studied in recent years. The complexes containing Ir(III) have usually been modified to further improve electroluminescence(EL) efficiency. In our previous work, $\text{Ir}(\text{ppy})_3$ [tris(5-phenyl-10,10-dimethyl-4-aza-tricycloundeca-2,4,6-triene)iridium] was synthesized by introducing pinene group as a spacer to decrease concentration quenching and showed good EL performances. In the present work, we studied the modified $\text{Ir}(\text{ppy})_3$ by attaching side alkoxy group to the pinene-2-phenylpyridine ligand, which is hoped to improve the chemical compatibility with host and further inhibit phase segregation in polymer matrix. The new series of Ir(III) complexes $[\text{Ir}(\text{RO-ppy})_3]$ were synthesized and the photophysical properties were investigated. Strong triplet emission peak at around 496 nm was observed with phosphorescence quantum yield $\Phi_{\text{F}}=0.4-0.6$, emission lifetimes $\tau=2-4 \mu\text{s}$. Complex 8 $[\text{Ir}(\text{C}_{16}\text{H}_{33}\text{O-ppy})_3]$ has special photophysical properties: no blue-shift on going from room temperature(298.15 K) to 77 K was observed and with relatively less part of long-lifetime in decay process. The results indicate that the complex with long side chains can reduce the aggregation between molecules, thus can be used as promising efficient phosphorescent emitter in OLEDs.

Key words [Iridium\(III\) complex](#) [Triplet](#) [Aggregation](#) [Phosphorescent material](#) [Organic light emitting diodes\(OLEDs\)](#)

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