

专题编号: (宋体, 小四, 斜体)

高 T_g 菲咯啉基电子传输材料: 面向低成本、高性能、 高稳定 OLED 与 OPV 器件应用

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近期我们设计制备菲咯啉基电子传输材料 **Phen-*m*-PhDPO** 与 **Phen-NaDPO**。**Phen-*m*-PhDPO** 作为空穴阻挡材料, 有望应用于高功率效率、高稳定性 (RGB) OLED 器件【1, 2】。**Phen-NaDPO** 电子迁移率: $\sim 10^{-4} \text{ cm}^2/\text{V}\cdot\text{s}$, $T_g \approx 116^\circ\text{C}$, 作为 OLED、OPV 器件的电子传输层, 显示重要应用前景。【3-8】

关键词: 有机发光二极管; 有机光伏器件; 电子传输材料; 高效率、器件稳定性

- 【1】 Wan-Yi Tan, Jian-Hua Zou, Dong-Yu Gao, Jun-Zhe Liu, Ning-Ning Chen, Xu-Hui Zhu,* Junbiao Peng,* Yong Cao, *Promising Operational Stability of Potentially High Power Efficiency Organic Light-Emitting Diodes Utilizing a Simple and Versatile Electron-Transport/Hole-Blocking Layer*, *Adv. Electron. Mater.* 2016, 2, 201600101 (Communication); Work to be submitted
- 【2】 <http://www.osadirect.com/news/article/1692/south-china-university-of-technology-researchers-develop-versatile-electron-transport-hole-blocking-materials/>
- 【3】 H. Zhang,* W.-Y. Tan, S. Fladischer, N. Li,* L.-L. Ke, T. Ameri, M. Turbiez, X.-H. Zhu,* Y. Cao, C. J. Brabec,* *Roll to roll compatible fabrication of inverted organic solar cells with a self-organized charge selective cathode interfacial layer*, *J. Mater. Chem. A*, 2016, 4, 5032 (Communication, hot article).
- 【4】 W.-Y. Tan, R. Wang, M. Li, G. Liu, P. Chen, X.-C. Li, S.-M. Lu, H. L. Zhu, Q.-M. Peng, X.-H. Zhu,* W. Chen,* W. C. H. Choy,* F. Li,* J.B. Peng, Y. Cao, *Lending triarylphosphine oxide to phenanthroline: a facile approach to high-performance organic small-molecule cathode interfacial material for organic photovoltaics utilizing air-stable cathodes*, *Adv. Funct. Mater.* 2014, 24, 6540.
- 【5】 **Phen-NaDPO** as a high-performance electron-transport layer for stable OLEDs, to be submitted.
- 【6】 Book chapter: W.-Y. Tan, X.-H. Zhu,* J.-W. Chen, Y. Cao,* *Conjugated polymer and organic molecules as cathode interfacial materials for polymer solar cells*, in *Handbook of Polymer and Hybrid Photovoltaics*, ed. S.-A. Chen, Wiley, Ch. 13, 2015, revised manuscript submitted.
- 【7】 <http://www.1-material.com/new-small-molecular-cathode-modifier-phen-nadpo/>
- 【8】 授权专利: 一类含有三芳基磷氧及氮杂环功能基团的醇溶性阴极缓冲层分子型材料及其合成方法与应用, CN201310275234

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