Development of Multifunctional Material for High-Performance White OLED

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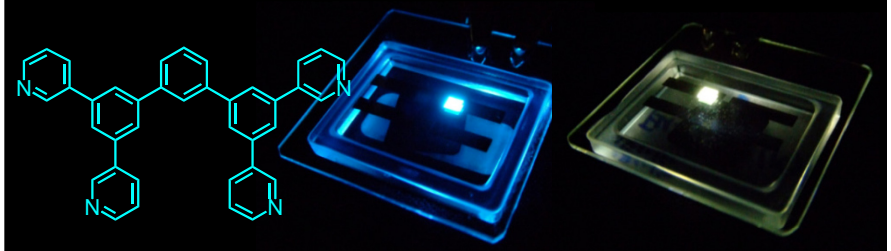
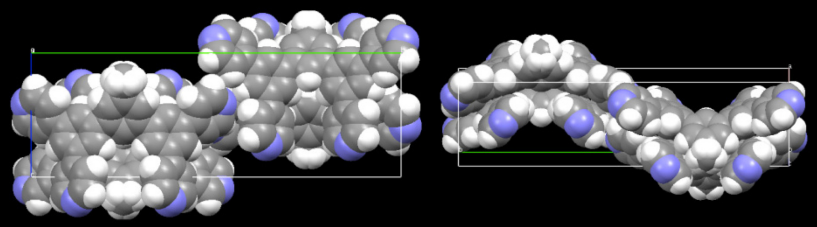
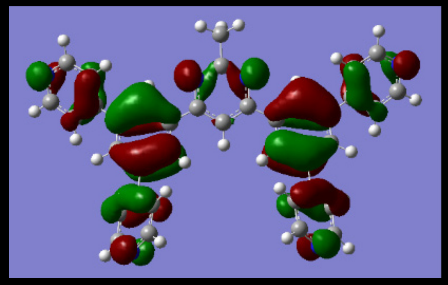


Multifunctional Material for High-Performance OLED



Unique Self-Assembled Nature in Solid State



- DFT Calculation
- Organic Synthesis
- Physical Properties
- Device Performances

Content:

Seventeen years has passed in 2010 since the first development of a white OLED by Kido and co-workers. Although the efficacy of this white OLED was reported to be below 1 lm W^{-1}, at the present time, some researchers have reported white OLEDs with efficacy up to 100 lm W^{-1} comparable to that of a fluorescent tube. Because white OLED is mercury-free illumination light-source and meet the EU WEEE & RoHS enforcement request, high-efficiency white OLED has great potential for energy-saving solid-state lighting and eco-friendly flat-display panels. To realize white OLED beyond fluorescent tube efficacy, a key solution is generation of novel phosphorescent materials. Because phosphorescent emitters enable an internal efficiency as high as 100% converting both singlet and triplet excitons into photons to make OLED efficacy 4 times higher than that with fluorescent emitters.

In our laboratory, we focus on the development of novel multifunctional materials for small-molecule based phosphorescent OLED, especially blue phosphorescent OLED and related materials.

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