

# Organic Luminescent Materials Featuring Aggregation-Induced Emission for Efficient Nondoped Organic Light-Emitting Diodes

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Aggregation-induced emission (AIE) has drawn continuously growing attention due to its great potential in material science and biological techniques. The AIE effect is expected to conquer the notorious aggregation-caused quenching encountered by conventional luminescent materials, and thus realize the high-performance organic light-emitting diodes (OLEDs) without complicated doping method. The luminescent materials with AIE property exhibit high solid-state photoluminescence efficiency up to unity, and function efficiently as light-emitting layers in nondoped OLEDs. Tunable electroluminescence colors from blue to red with excellent efficiencies approaching theoretical limit are attained by the devices. Rational modifications on AIE materials with carrier-transporting functional groups can endow the luminescent materials with not only high solid-state emission efficiencies but also good hole- or electron-transporting abilities. The nondoped bilayer OLEDs fabricated by utilizing these multifunctional materials as light-emitting and hole-transporting/electron-transporting simultaneously afford high efficiencies. The combination of AIE and thermally activated delayed fluorescence (TADF) can generate robust luminescent materials with high exciton utilization, providing remarkably high electroluminescence efficiency with extremely small efficiency roll-off for nondoped OLEDs. High-performance white OLEDs are also achieved by AIE materials. These results clearly manifest the practical utility of the AIE effect in development of active materials for OLEDs