

# 9,10-Di(2-naphthyl)anthracene derivatives as hosts and emitters for solution-processed blue fluorescent OLEDs

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The series of new anthracene derivatives were successfully synthesized as host and emitter materials for solution-processed blue fluorescent organic light emitting diodes (OLEDs), which could be used both as host and dopant. Especially, new synthetic blue fluorescent materials showed high solubility in common solvent with anthracene moieties without any alkyl chains. They also could be appropriately twisted and have a rigid structure to increase the thermal stability for a stable device performance. With those novel blue fluorescent materials, we created solution-processed fluorescent OLEDs. And a new anthracene derivative [9-(9,10-di(naphthalen-2-yl)anthracen-2-yl)-9H-carbazole (**DN-2-CzA**)] as a host material exhibited moderately high efficiency and external quantum efficiency of up to 3.2 cd/A and 1.6 %, respectively, when we utilized BDAVBi as a dopant. Meanwhile, the [N-(naphthalen-1-yl)-9,10-di(naphthalen-2-yl)-N-phenylanthracen-2-amine (**DN-2-NPAA**)] as a dopant material showed pretty good device performance, up to 5.2 cd/A and 2.2 % (EQE), when we utilized TBADN as a host.

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## References

1. S. J. Cha, N.S. Han, J. K. Song, S. -R. Park, Y. M. Jeon, M. C. Suh, *Dyes Pigments*, 120, 200 (2015).
2. J. -H. Yun, Y. C. W. Lee, K. S. Yook, J. Y. Lee, *Synth. Mater.*, 217, 216 (2016).
3. S. -R. Park, D. H. Shin, S. -M. Park, M. C. Suh, *Rsc Adv.*, 7, 28520 (2017).