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Efficient blue PhOLEDs using host materials of lower triplet energy than the emitter JAMES SWENSEN, EVGUENI POLIKARPOV, AMBER VONRUDEN, LIANG WANG, ASANGA PADMAPERUMA, Pacific Northwest National Laboratory — It is a commonly held view that the host material for a phosphorescent emitter in an organic light emitting device (OLED) must have a triplet energy higher than that of the phosphorescent emitter in order to obtain high quantum efficiencies. We show that a combination of HTL, ETL and host with appropriate energy levels can provide high external quantum efficiency (EQE), even with a host triplet energy smaller than that of the emitter. Specifically, we report results for a new host material, 4-(di-p-tolylamino)phenyl)diphenylphosphine oxide, with a triplet energy lower than FIrpic that demonstrate improved OLED performance. Our results suggest modified design rules for the development of new, high performance host materials. Molecular design strategies, device design and OLED data will be discussed.

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