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Aggregation can enhance the O/PLED efficiency¹ ZHIGANG SHUAI, Institute of Chemistry, Chinese Academy of Sciences, SHIWEI YIN COLLABORATION, QIAN PENG COLLABORATION, LINGYUN ZHU COLLABORATION, WEIHAI FANG COLLABORATION, YI LUO COLLABORATION — In general, the aggregation effects are expected to quench the luminescence. Here, we show in two instances that the intermolecular interaction can enhance the O/PLEDs internal quantum efficiency. At first instance, for the organic LEDs, the siloles molecules exhibit exotic emission behavior, namely, non-luminescent in solution form, but highly luminescent in aggregation. After a detailed theoretical calculation on the non-adiabatic decay rate, we find that it is the aggregation inhibit the radiationless route, thus allowing the radiative decay in solid state. In terms of PLEDs, we take into account both the electronic correlation and electron-phonon coupling, and we find that the interchain coupling effects can actually allow PLEDs to have much higher internal quantum efficiency than the 25% spin statistical limit.

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