

Aggregation Induced Emission: organic and hybrids fluorophores

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Some organic molecules show Aggregation Induced Emission (AIE), this property has been used to prepare Organic Light Emitting Diodes (OLEDs) or biologic fluorescent sensors.¹ Benzophospholes derivatives (**1**, Fig 1b, $\pi = \text{Ph}$) are known to present the AIE property and thus can be used to design highly emissive materials in solid state.² Moreover, this structure present a strong advantage: the P atom is reactive and can be functionalized to bring several properties to the molecule.³ Here, the P atom was functionalized with POOEt group in order to maximize the luminescence properties. In addition this offers the possibility for further grafting on different inorganic nanoparticles (ZnO and HgS), through the POOH group.⁴ The preparation of hybrid nanoparticles allowed us to combine luminescent properties from the organic part and new properties coming from the inorganic part (charge transport, chirality...). Several fluorophores have been synthesized in order to tune the emission properties in the visible range and adapt the HOMO and LUMO levels. The synthesis and the photophysical properties of those new AIE fluorophores will be presented as well as their recent use in OLEDs or for the preparation of new hybrid materials showing circularly polarized luminescence (CPL).

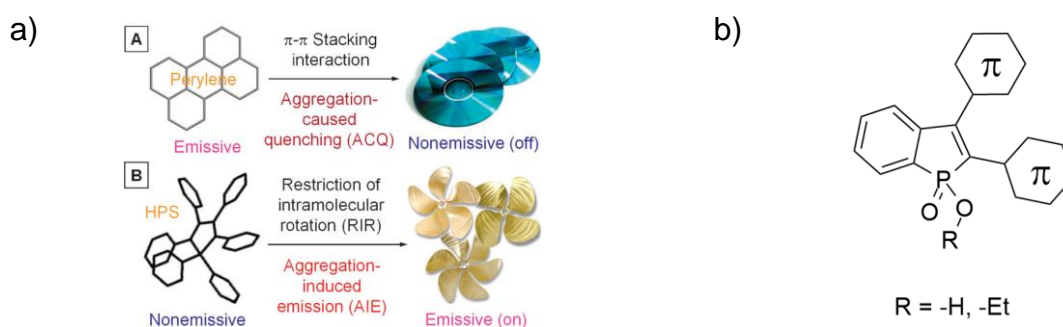


Figure 1: a) effect of aggregation on the luminescence of organic compounds; b) structure of synthesized benzophospholes.

¹ B. Z. Tang, et al., Chem. Soc. Rev. **2011**, 40, 5361.

² B. Z. Tang, et al., J. Mater. Chem. C, **2017**, 5, 1836

³ M. Hissler, et al., Chem. Soc. Rev. **2016**, 45, 5296

⁴ M. Hissler et al. Intern. Patent **2014** [WO2015EP53859 20150224](https://patents.google.com/patent/WO2015EP53859_20150224)