摘要

Special Topic: Aggregated-Induced Emission

Construction of deep-blue AIE luminogens with TPE and oxadiazole units

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Abstract: In this paper, two AIE-active luminogens (**Oxa-*p*TPE** and **Oxa-*m*TPE**) constructed from tetraphenylethene and oxadiazole units were successfully synthesized and their thermal, optical and electronic properties were investigated. By linking TPE to the oxadiazole core through *meta*- or *para*- position, the intramolecular conjugation is effectively controlled. Thanks to the intelligent molecular design and specific AIE feature, when fabricated as emissive layers in non-doped OLEDs, they exhibit blue or deep-blue emission with CIE coordinates of (0.17, 0.23) and (0.15, 0.12), and good efficiencies with $\eta_{C, \max}$ and $\eta_{P, \max}$ up to 1.52 cd A⁻¹ and 0.84 lm W⁻¹, shedding some light on the construction of deep-blue AIE fluorophores.

Keywords: aggregation-induced emission, tetraphenylethene, deep-blue emitter, organic light-emitting diodes

Chemical structures of Oxa-*m*TPE and Oxa-*p*TPE.

EL performances of Oxa-*p*TPE and Oxa-*m*TPE^{a)}

	V_{on} (V)	L_{max} (cd m ⁻²)	$\eta_{P, \max}$ (lm w ⁻¹)	$\eta_{C, \max}$ (cd A ⁻¹)	$\eta_{ext, \max}$ (%)	CIE (x, y)
Oxa-<i>p</i>TPE	5.10	615	0.84	1.52	0.97	0.17, 0.23
Oxa-<i>m</i>TPE	6.25	750	0.49	0.72	0.82	0.15, 0.12

a) Abbreviations: V_{on} = turn-on voltage at 1 cd m⁻², L_{max} = maximum luminance, $\eta_{P, \max}$, $\eta_{C, \max}$ and $\eta_{ext, \max}$ = maximum power, current and external efficiencies, respectively. CIE = Commission International de l'Eclairage coordinates.