Supplementary Material

Impact of chiral ligands on photophysical and electro-optical properties of β-diketonate Europium complexes in circularly polarized OLEDs

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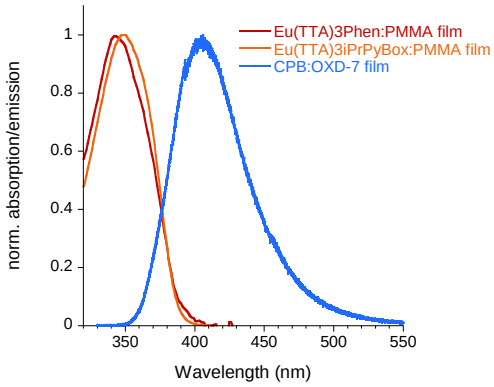

Figure S1. Spectral overlapping between PL of the CBP:OXD-7 matrix and absorption of the complexes that favour a resonant energy transfer (FRET) from the energy donor host matrix to the Eu-complex acceptor.

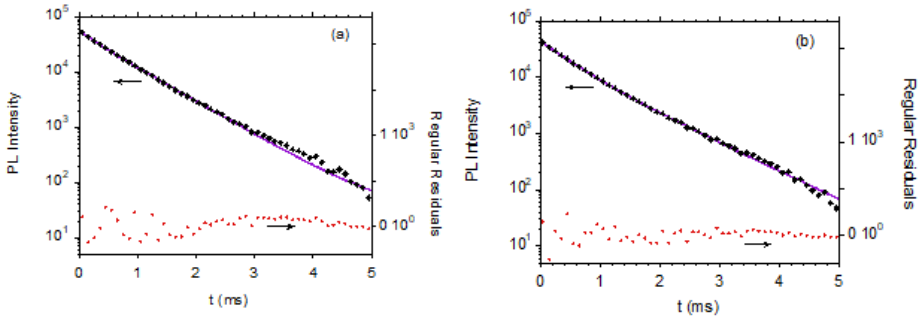

Figure S2. PL decays of PMMA films embedding (a) Eu(TTA)$_3$^{i}PrPyBox excited at 350 nm, emission at 619 nm, biexponential fit with parameters (0.14) 237 µs, (0.86) 713 µs, Adj. R-Square 0,99994, average lifetime 689 µs; (b) Eu(TTA)$_3$Phen excited at 350nm, emission at 611 nm, biexponential fit with parameters (0.53) 443 µs, (0.47) 870µs, Adj. R-Square 0,99995, average lifetime 712 µs.

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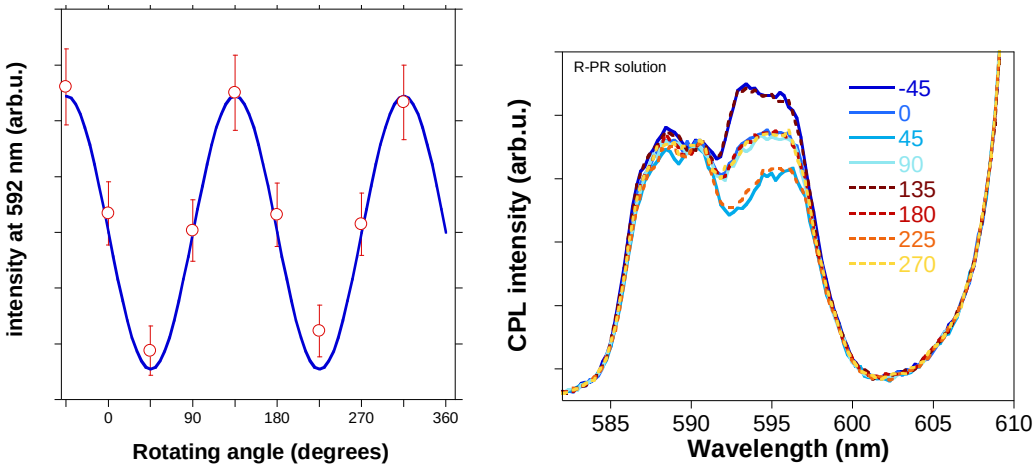

Figure S3. Emission intensity of $Eu(TTA)_3{}^{i}PrPyBox$ toluene solution periodically decreases and increases in response to the angle θ of the easy axis of the rotating QWP with respect to the axis of the fixed LP.

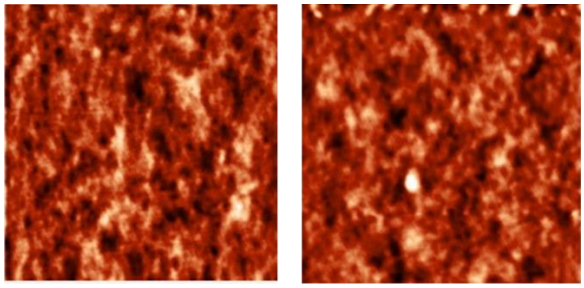

Figure S4. Films of CPB:OXD-7 blends embedding 6 wt.% of (a) $Eu(TTA)_3{}^{i}PrPyBox$ and (b) $Eu(TTA)_3Phen$ deposited over a PVK-covered substrate, shows similar topography (2 μm x 2 μm) with surface root mean square roughness (RMS) in the range of 0.21-0.24 nm.

Table S1. Overall PLQY of all the complexes in solution [toluene, conc. 10^{-5} M], the relative integrated intensity of the $^5D_0 \rightarrow {}^7F_2$ transition with respect to that of the $^5D_0 \rightarrow {}^7F_1$ transition band (A_{21}), $^5D_0$ lifetime (τ_{obs}), radiative (A_{RAD}) and nonradiative (A_{NR}) decay rates, intrinsic PLQY of Eu(III) ($PLQY^{Eu}_{Eu}$), and the energy transfer efficiencies (η_{sens}).

complex	A_{21}	t_{obs} (μs)	A_{RAD} (s^{-1})	A_{NR} (s^{-1})	$PLQY^{Eu}_{Eu}$ (%)	PLQY (%)	η_{sens} (%)
$Eu(TTA)_3{}^{i}PrPyBox$	16.30	574	874	868	50	30	60
$Eu(TTA)_3Phen$	15.63	710	702	707	50	48	96

Table S2. The EQEs of Eu-based OLEDs and CP-OLEDs reported in literature.

OLED structure	V_{on} (V)	L_{max}(cd m^{-2})	EQE (%)	Ref.
ITO/PEDOT:PSS/PVK/CBP:**Eu**/TPBi/LiF/Al	12	620	6.1	1
ITO/**Eu**:polycarbonate (PC):TPD/PBD/Ca/Ag	\	\	5	2
ITO/PEDOT:PSS/PVK/CBP:PBD:**Eu**/TPBi/LiF/Al	\	\	5.3	3
ITO/PEDOT:PSS/PVK/PFO:PBD:**Eu**/Ba/Al	7.3	1381	2.5	4
ITO/PEDOT:PSS/PVK:OXD-7:**Eu**/Ba/Al	\	2.7	0.0042	5
ITO/PEDOT:PSS/TCTA:OXD-7:**Eu**/PolarP/Ba/Al	\	\	0.05	6
ITO/PEDOT:PSS/CBP:OXD-7:**Eu**/LiF/Al	4.90	1547	2.8	7
ITO/PEDOT:PSS/CBP:OXD-7:**Eu**/BCP/LiF/Al	6.7	1234	2.3	8

References

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