Electronic Supplementary Information

Blue-green-emitting Cationic Iridium Complexes with Oxadiazole-type Counter-anions and Their Use for Highly Efficient Solution-processed Organic Light-emitting Diodes

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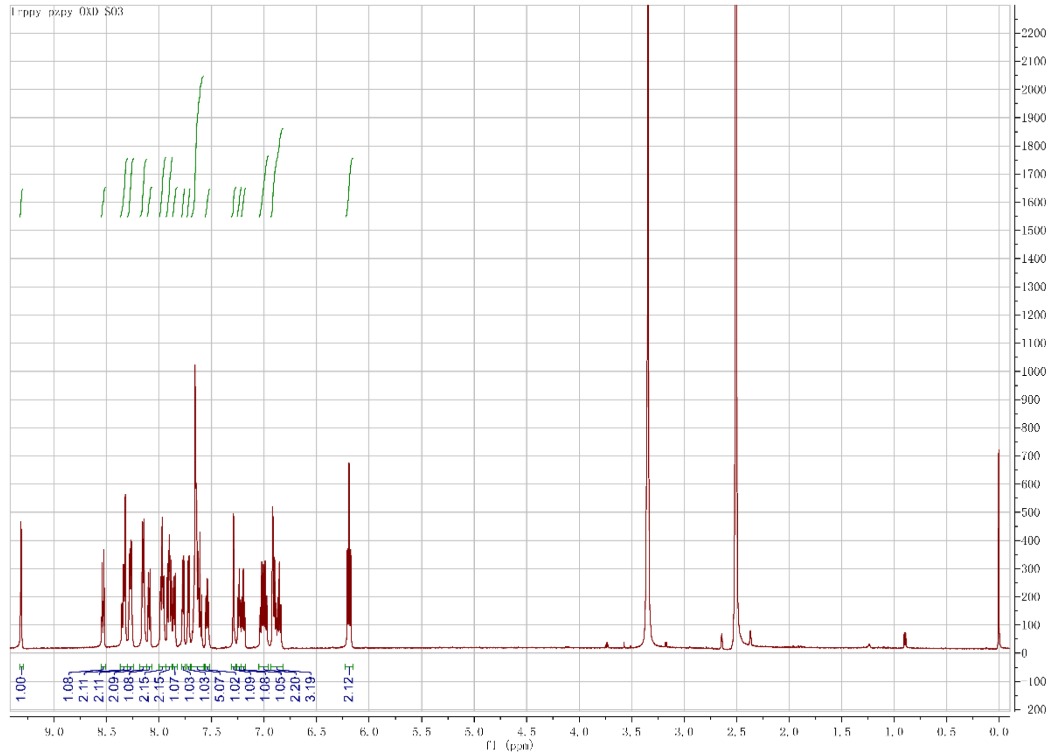
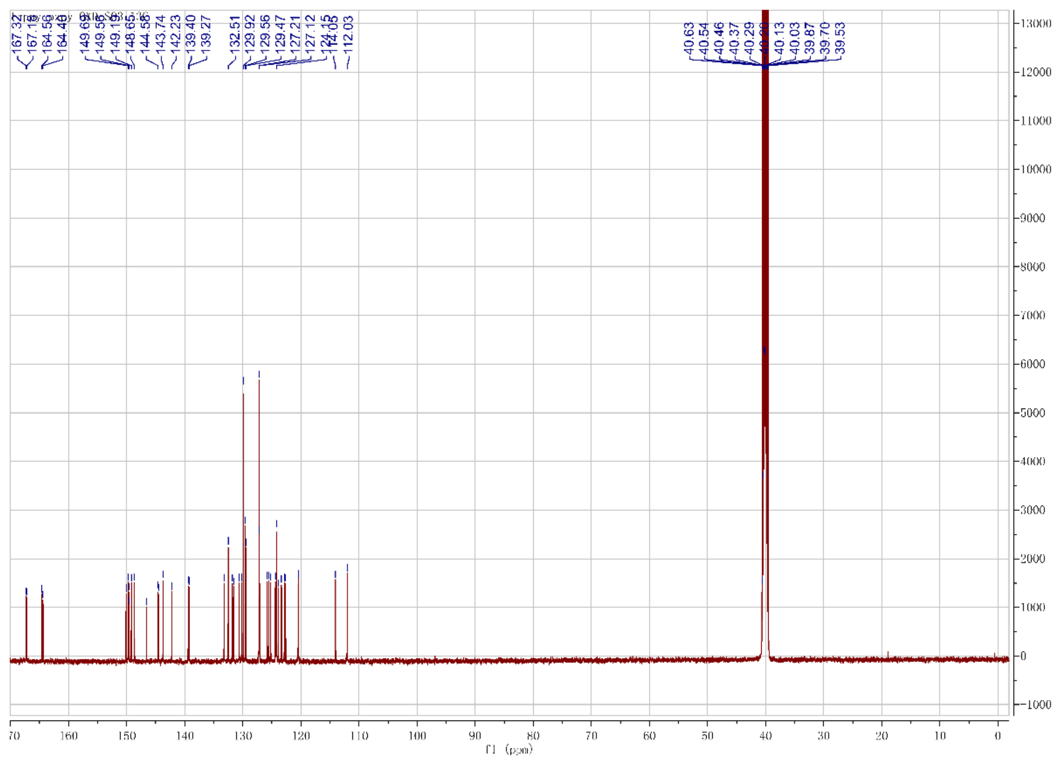
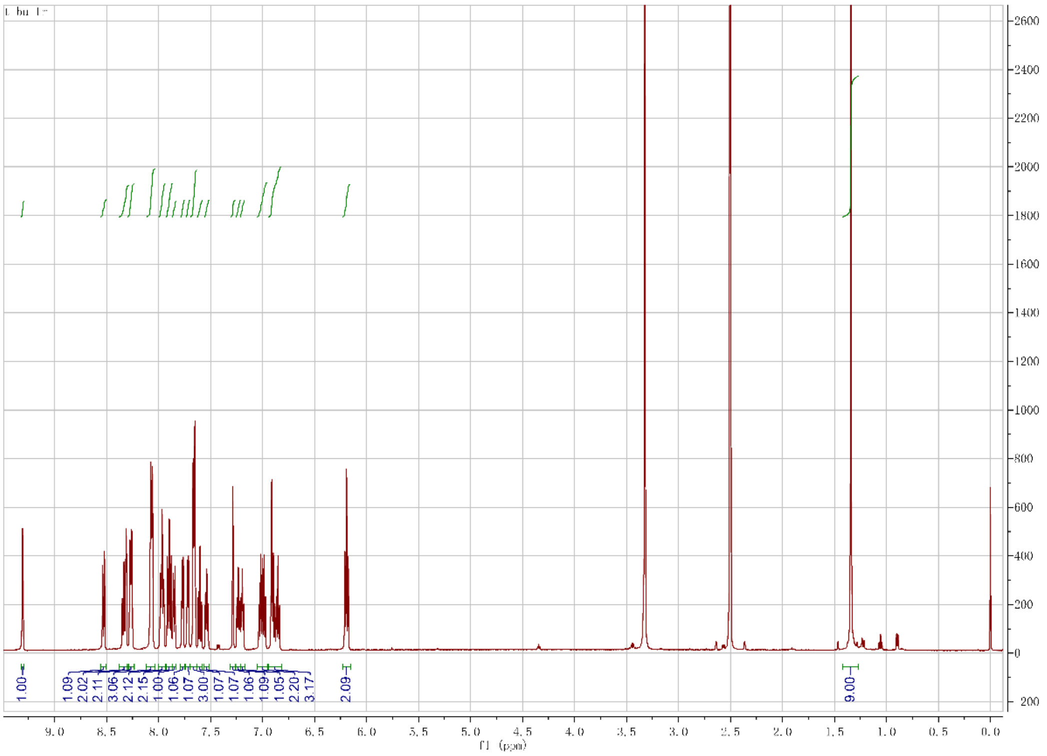


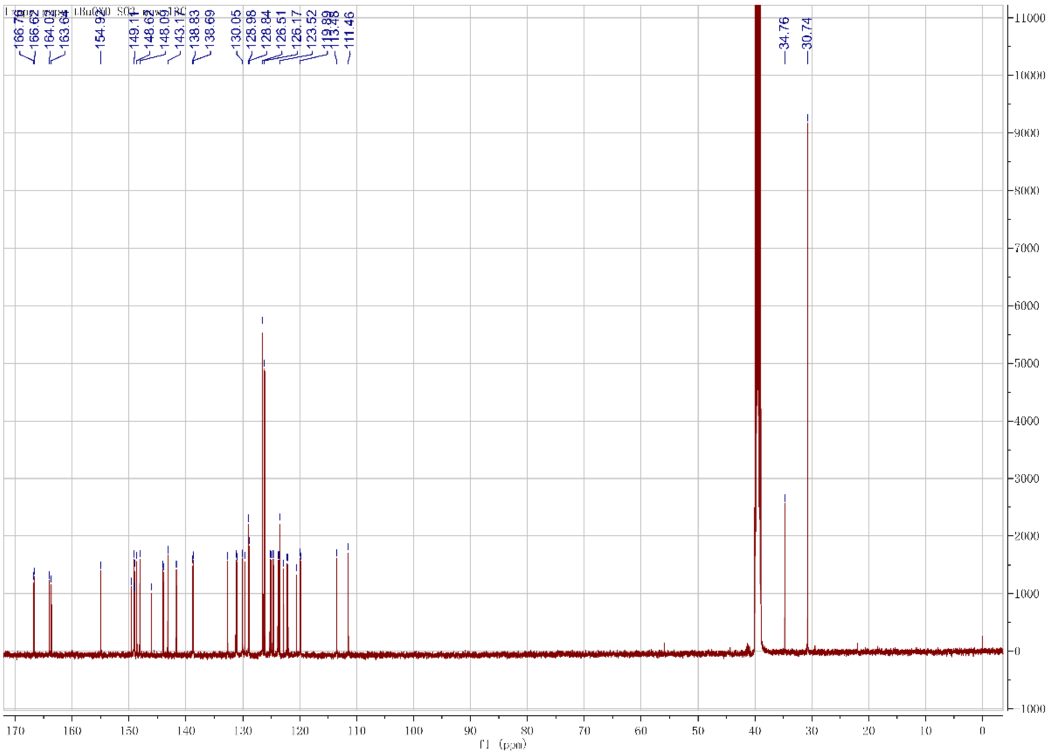
Scheme S1. [1]H-NMR spectrum of complex1 in DMSO-d_6.



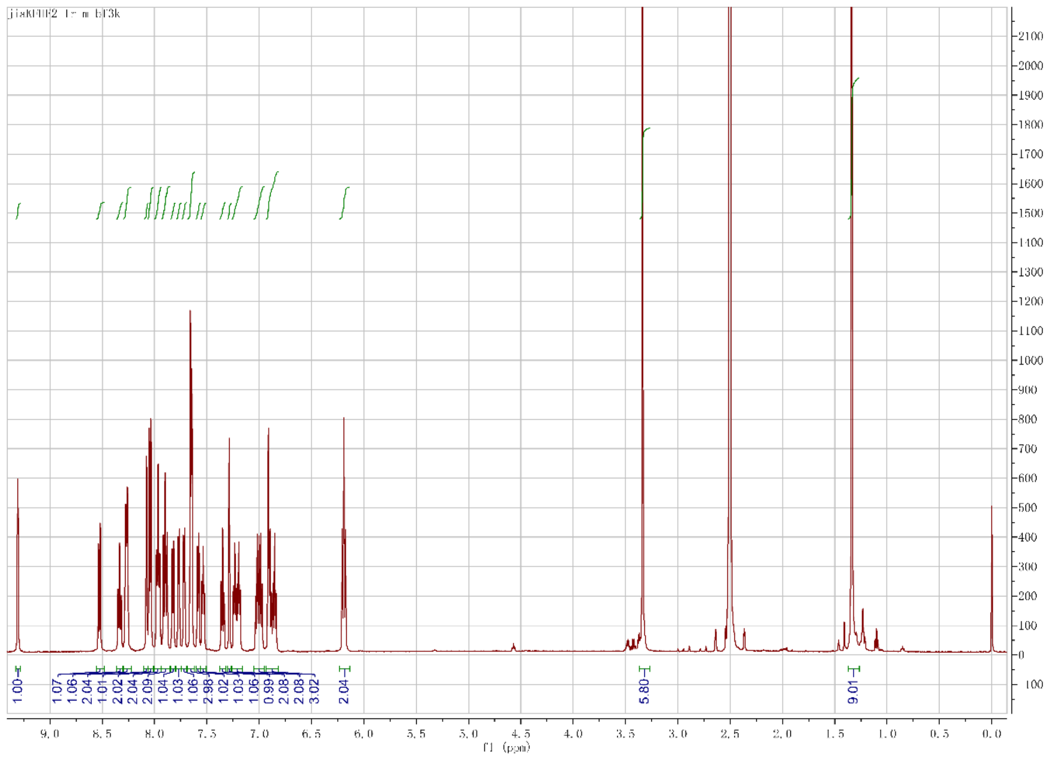
Scheme S2. [13]C-NMR spectrum of complex 1 in DMSO-d_6.



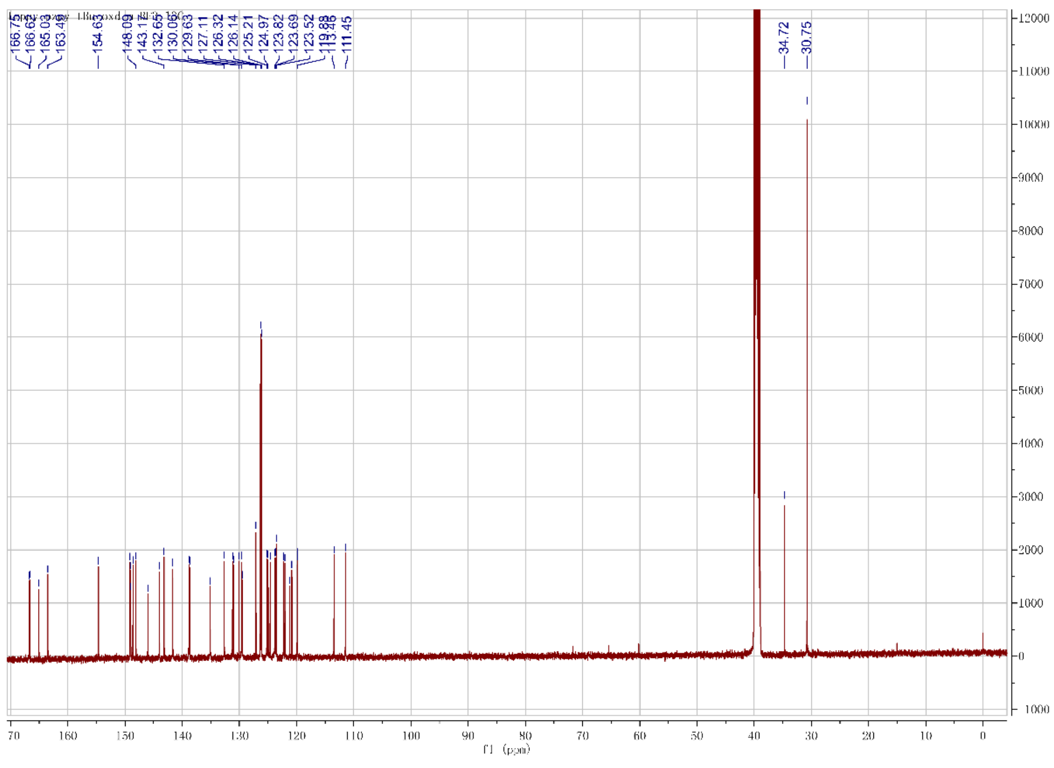
Scheme S3. ^{1}H-NMR spectrum of complex 2 in DMSO-d_6.



Scheme S4. ^{13}C-NMR spectrum of complex 2 in DMSO-d_6.



Scheme S5. [1]H-NMR spectrum of complex 3 in DMSO-d_6.



Scheme S6. [13]C-NMR spectrum of complex 3 in DMSO-d_6.

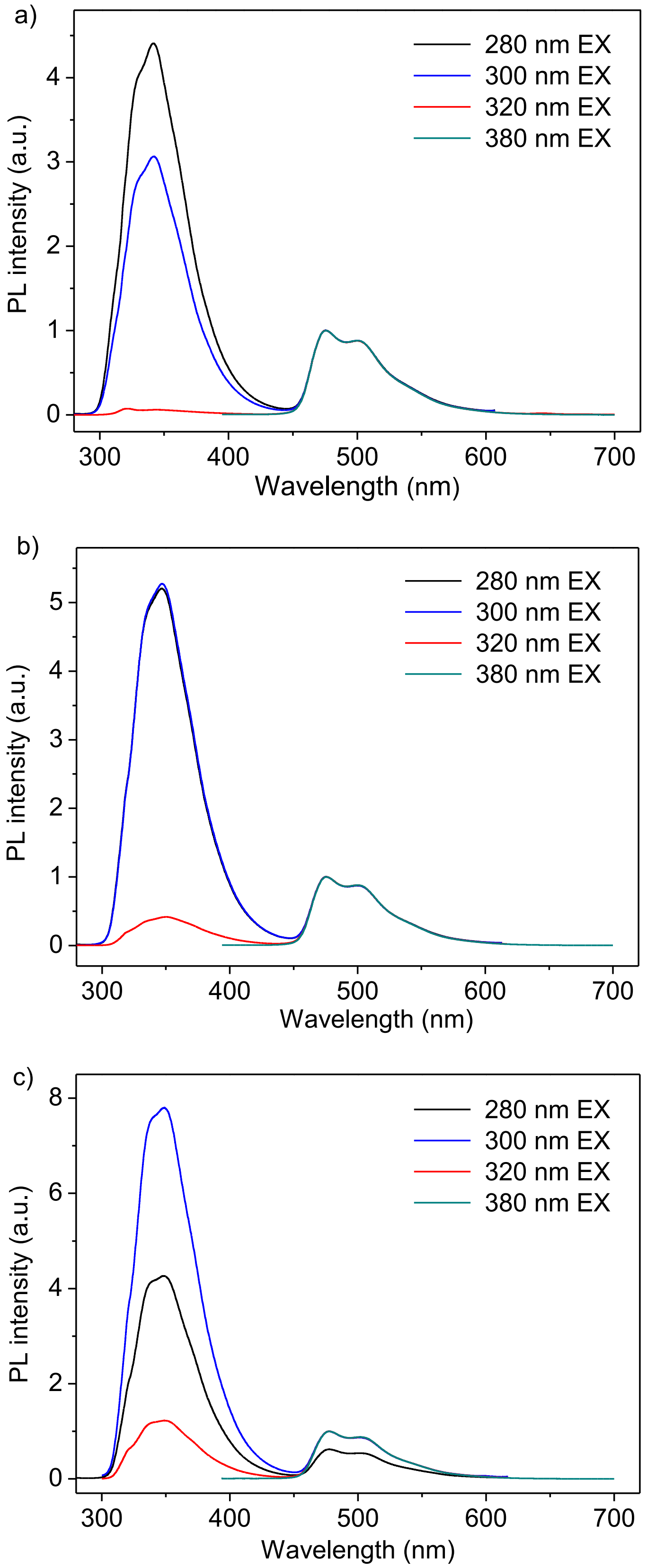


Figure S1. PL spectra of a) complex 1, b) complex 2 and c) complex 3 in degassed CH_3CN solution under different excitation wavelength.

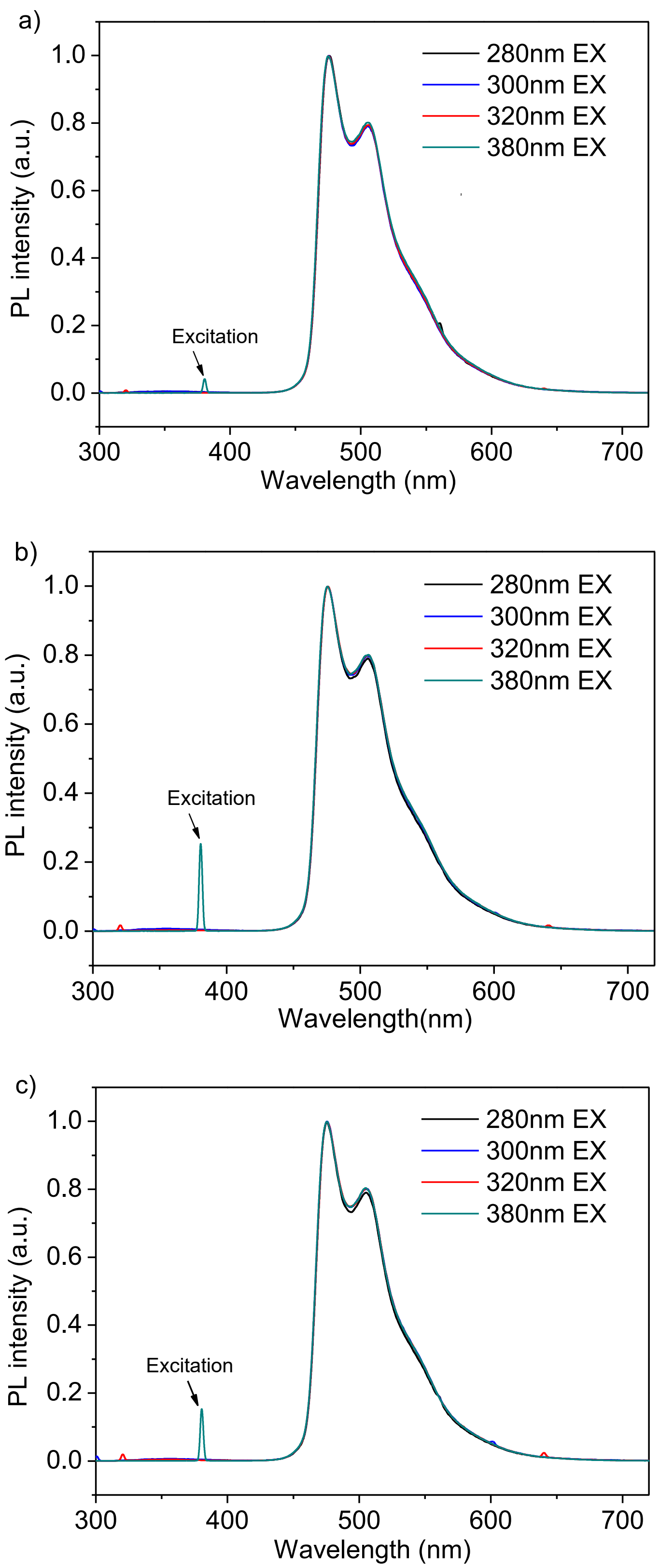


Figure S2. PL spectra of a) complex 1, b) complex 2 and c) complex 3 in 2 wt.% doped PMMA films under different excitation wavelength. The sharp peak at 380 nm results from residual excitation.

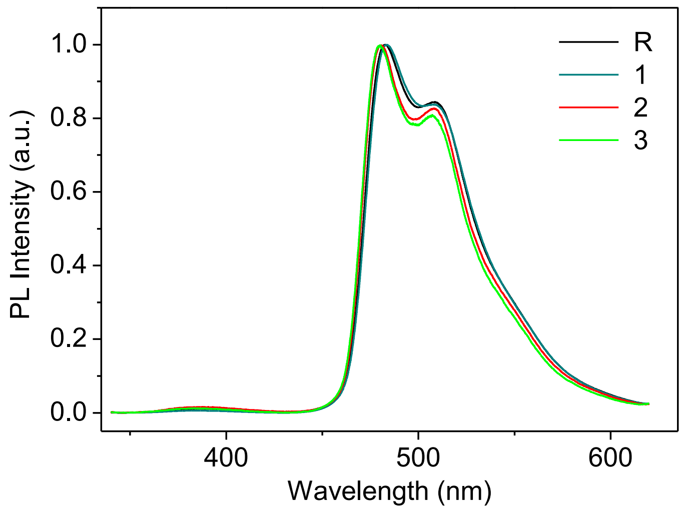
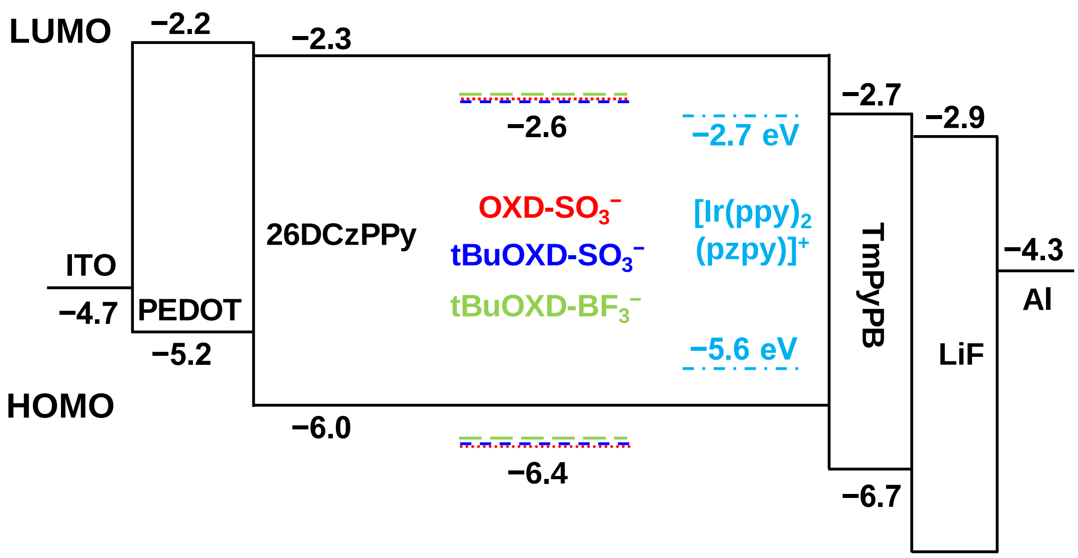


Figure S3. PL spectra of the emissive layers of OLEDs using complexes R and 1-3.



Scheme S7. Energy level (in eV) diagrams for OLEDs based on complexes R and 1-3. The LUMO levels of $OXD\text{-}SO_3^-$, $tBuOXD\text{-}SO_3^-$ and $tBuOXD\text{-}BF_3^-$ were calculated from their electrochemical reduction potentials and the HOMO levels were calculated on the basis of LUMO levels and optical band gaps.

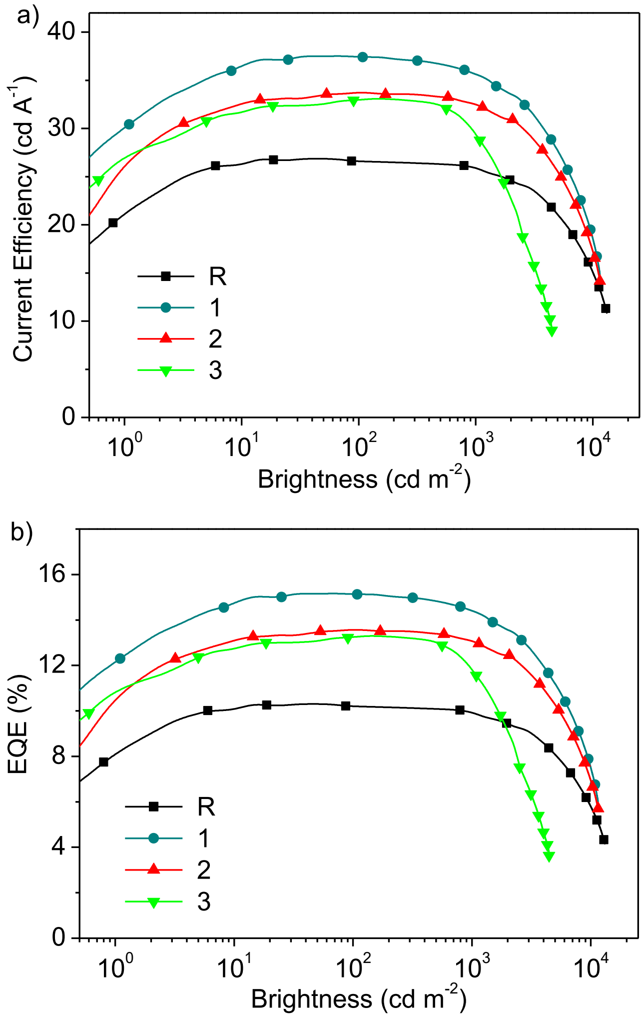


Figure S4. a) Current efficiency and b) EQE versus brightness curves for OLEDs based on complexes R and 1-3.

Table S1. Summary of performances of OLEDs using cationic iridium complexes.

Solution-processed OLEDs							
Color	V_{on} (V)	$\eta_{c,max}$ (cd/A)	EQE_{max}	B_{max} (cd/m^2)	EL λ (nm)	CIE (x, y)	Ref.
Blue	4.1	2.5	N. R.	1950	458	(0.16, 0.27)	1
	6.2	17.2	7.5%	12800	474, 500	(0.19, 0.38)	2
	6.8	12.6	6.3%	7000	472, 488	(0.19, 0.35)	3
Blue-green	6.1	22.4	8.2%	24000	486, 512	(0.23, 0.50)	2
	4.2	24.3	9.7%	30300	484, 508	(0.19, 0.47)	4
	6.5	24.5	9.8%	17800	484, 506	(0.21, 0.48)	5
	N. R.	12.4	N. R.	5700	480, 507	(0.21, 0.48)	6
	7.4	25.8	8.8%	30466	508 nm	(0.27, 0.49)	7
	6.4	N. R.	5.4%	1790	N. R.	(0.25, 0.48)	8
	N. R.	17.1	6.8%	14200	482, 508	(0.21, 0.48)	9
	4.0	**37.6**	**15.2%**	**12000**	**481, 510**	**(0.18, 0.49)**	**This work**
Green	4.4	25.3	8.1%	38500	526	(0.34, 0.56)	4
	5.8	20.8	6.3%	N. R.	527	(0.29, 0.58)	10
Yellow	12	22.5	7.5%	N. R.	540	N. R.	11
	4.3	30.6	10.2%	8865	548	(0.41, 0.55)	12
	4.7	17.5	6.9%	13019	572	(0.44, 0.54)	13
	9.1	17.4	6.4%	15560	N. R.	(0.47, 0.51)	14
	N. R.	20.4	11.4%	11032	N. R.	(0.44, 0.54)	15
Orange	6.5	4.2	3.2%	6300	620	(0.61, 0.38)	4
Vacuum-evaporated OLEDs							
Color	V_{on} (V)	$\eta_{c,max}$ (cd/A)	EQE_{max}	B_{max} (cd/m^2)	EL λ (nm)	CIE (x, y)	Ref.
Blue	7.0	1.5	1.5%	5700	452	(0.18, 0.19)	16
	3.5	23.4	11%	8195	N. R.	(0.21, 0.33)	17
Blue-green	3.0	24.5	9.8%	11500	482, 506	(0.21, 0.44)	18
	2.5	26.4	10.4%	11000	500	(0.24, 0.45)	19
	2.9	29.1	11.3%	15000	500	(0.27, 0.50)	20
Green	5.7	11.3	3.7%	17900	528	(0.37, 0.56)	21
Yellow	5.0	19.7	6.5%	15611	565	N. R.	22
	2.3	40.8	13.4%	>27300	556	(0.42, 0.54)	19
	2.3	46.5	14.8%	>27300	556	(0.43, 0.55)	23
	2.3	48.9	15.8%	>27300	558, 586	(0.48, 0.51)	23
	2.4	41.8	14.7%	>27300	560, 592	(0.49, 0.49)	24
	2.3	**51.9**	**16.4%**	**>27300**	**542**	**(0.37, 0.58)**	**19**
Orange	2.4	18	11.1%	18800	588, 624	(0.59, 0.40)	23
	3.3	17.8	10.5%	25035	589, 622	(0.60, 0.40)	25
Red	2.6	8.3	9.8%	1620	626	(0.65, 0.34)	19

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