Supporting information

Efficient sky-blue emitting Pt(II) complexes based on imidazo[1,2-f]phenanthridine-containing tetradeutate ligands

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Figure S1. $^1$H NMR spectrum of 2-bromo-5-methoxybenzonitrile (CDCl$_3$).

Figure S2. $^1$H NMR spectrum of 8-methoxyphenanthridin-6-amine (CDCl$_3$).
Figure S3. $^1$H NMR spectrum of 1-methoxyimidazo-[1,2-f]-phenanthridine (DMSO-$d_6$).

Figure S4. $^1$H NMR spectrum of 3-bromo-11-methoxyimidazo [1,2-f] phenanthridine (CDCl$_3$).
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Figure S6. $^1$H NMR spectrum of 3-mesitylimidazo [1,2-f]
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Figure S7. $^1$H NMR spectrum of L1 (DMSO-d6).

Figure S8. $^{13}$C NMR spectrum of ligand of L1 (DMSO-d6).
Figure S9. $^1$H NMR spectrum of Pt1 (DMSO-$d_6$).

Figure S10. $^{13}$C NMR spectrum of Pt1 (CDCl$_3$).
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Figure S13. $^{1}$H NMR spectrum of Pt2 (DMSO-$d_6$).

Figure S14. $^{13}$C NMR spectrum of Pt2 (DMSO-$d_6$).
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Figure S16. $^{13}$C NMR spectrum of L3 (DMSO-$d_6$).
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Figure S18. $^{13}$C NMR spectrum of Pt3 (DMSO-$d_6$).
Figure S19. The TGA curves of Pt1, Pt2 and Pt3 at a heating rate of 10 °C/min under N₂.
Figure S20. UPS spectra of Pt1, Pt2 and Pt3.
### Table S1. Density functional theory (DFT) calculations for complexes Pt1, Pt2, and Pt3.

<table>
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<th>Compound</th>
<th>LUMO [eV]</th>
<th>HOMO [eV]</th>
<th>$E_g$ [eV]</th>
<th>$S_1$ [eV]</th>
<th>$T_1$ [eV]</th>
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</table>
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Figure S23. The power efficiency-luminance curves for Pt1 at different doping ratios.
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Figure S25. The power efficiency-luminance curves for Pt2 at different doping ratios.
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Figure S27. The EQE-luminance-current efficiency curves for Pt2 at different doping ratios.
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Figure S29. The power efficiency-luminance curves for Pt3 at different doping ratios.
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Figure S33. Transient phosphorescence decay of Pt1-Pt3 in degassed dichloromethane at room temperature.
Figure S34. Lifetime curve of Pt1 device at an initial luminance of 1000 cd/m².

The operational lifetime of Pt1 based device gave a short $T_{50}$ less than 1 hour at an initial luminance of 1000 cd m⁻², possibly due to the poor stability of the blue emitter.