

Electronic Supplementary Information

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Title: A novel cationic iridium(III) complex as red phosphor applied in warm white light-emitting diodes

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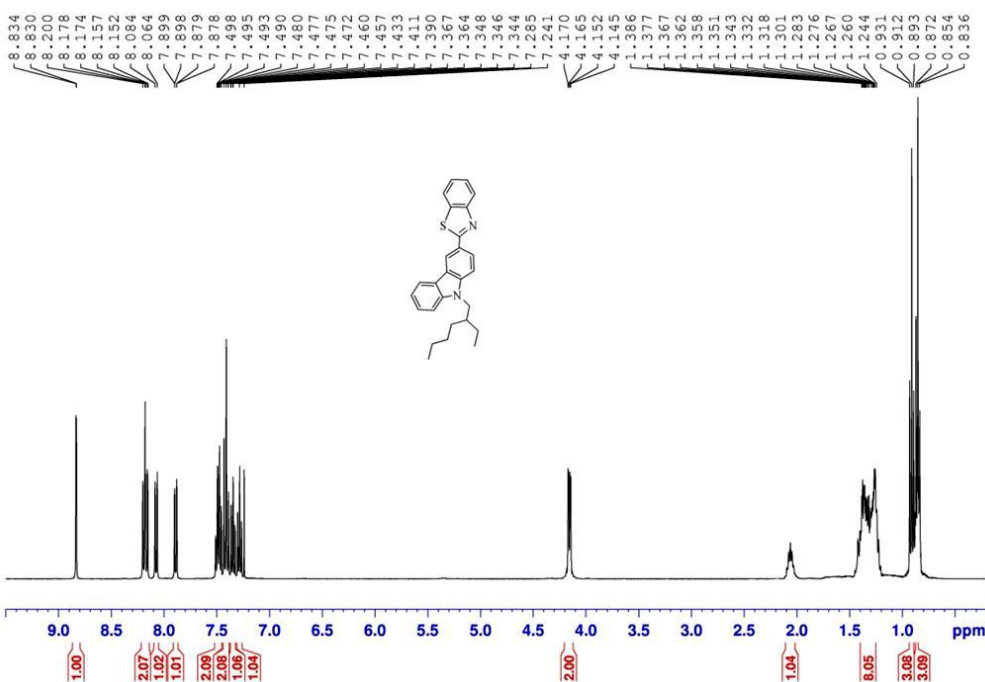


Figure S1. ^1H NMR spectra of 2-(9-(2-ethylhexyl)-9H-carbazol-3-yl)benzo[d]thiazole (compound **3**)

^1H NMR (400MHz, CDCl_3 , ppm), δ : 8.83 (d, 1H, $^3J = 1.6$ Hz, ArH), δ : 8.15–8.20 (m, 2H, ArH), δ : 8.07 (d, 1H, $^3J = 8.0$ Hz, ArH), δ : 7.89 (dd, 1H, $^3J = 8.0$ Hz, $^4J = 0.4$ Hz, ArH), δ : 7.24–7.50 (m, 6H, ArH), δ : 4.16 (dd, 2H, $^3J = 7.6$ Hz, $^4J = 2.0$ Hz, $^4J = 3.5$ Hz, $-\text{N}-\text{CH}_2-$), δ : 2.01–2.11 (m, 1H, $-\text{CH}<$), δ : 1.26–1.39 (m, 8H, alkyl-H), δ : 0.91 (t, 3H, $^3J = 5.7$ Hz, $-\text{CH}_3$), δ : 0.86 (t, 3H, $^3J = 4.4$ Hz, $-\text{CH}_3$).

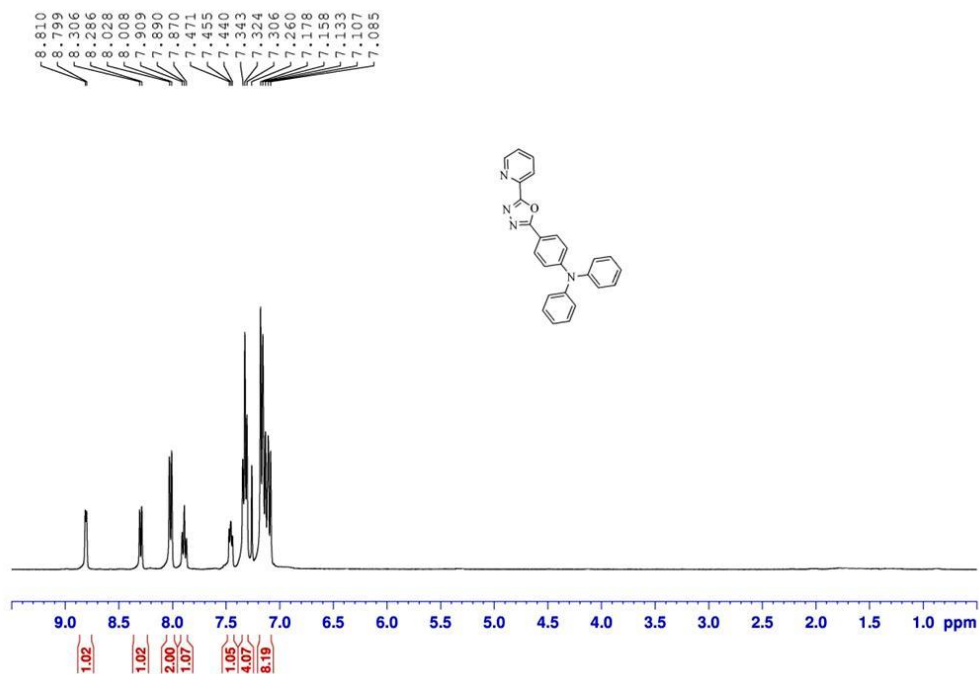


Figure S2. ¹H NMR spectra of N,N-diphenyl-4-(5-(pyridin-2-yl)-1,3,4-oxadiazol-2-yl)aniline (compound **8**)

¹H NMR (400MHz, CDCl₃, ppm), δ : 8.80 (d, 1H, $^3J = 4.4$ Hz, pyridine-H), δ : 8.30 (d, 1H, $^3J = 8.0$ Hz, ArH), δ : 8.02 (d, 2H, $^3J = 8.0$ Hz, ArH), δ : 7.89 (t, 1H, $^3J = 8.0$ Hz, ArH), δ : 7.46 (t, 1H, $^3J = 6.4$ Hz, ArH), δ : 7.32 (t, 4H, $^3J = 7.6$ Hz, ArH), δ : 7.09-7.18 (m, 8H, ArH).

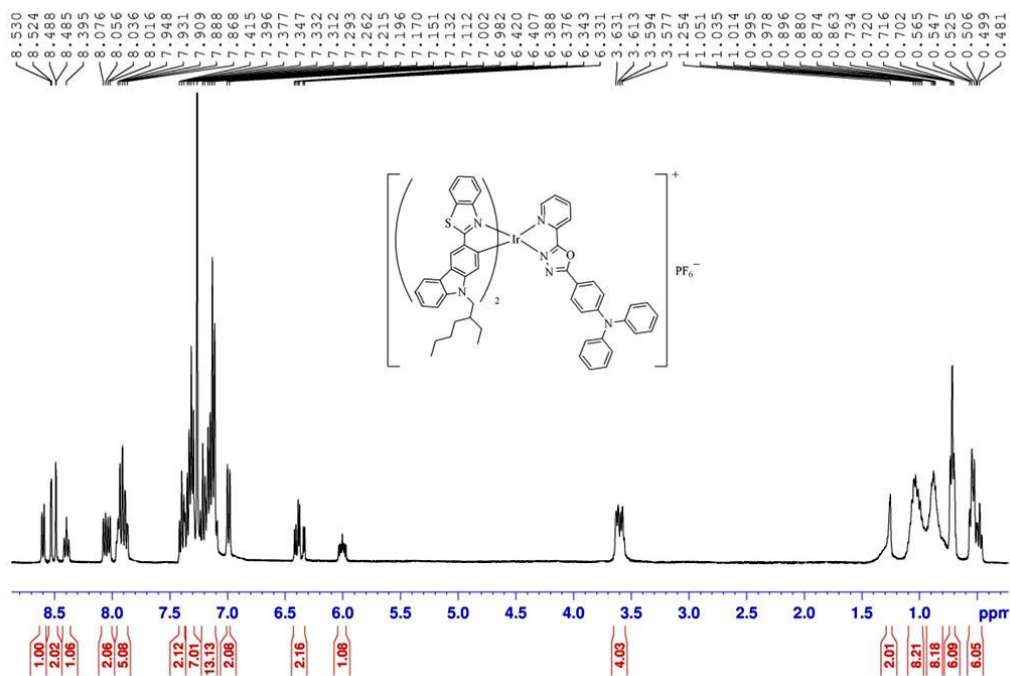


Figure S3. ^1H NMR spectra of the cationic iridium(III) complex

^1H NMR (400MHz, CDCl_3 , ppm), δ : 8.60 (d, 1H, $^3J = 7.6$ Hz, ArH), δ : 8.53 (s, 1H, ArH), 8.49 (s, 1H, ArH), δ : 8.40 (t, 1H, $^3J = 8.0$ Hz, ArH), δ : 8.05 (q, 2H, $^3J = 8.0$ Hz, ArH), δ : 7.87–7.95 (m, 5H, ArH), δ : 7.40 (t, 2H, $^3J = 7.6$ Hz, ArH), δ : 7.29–7.35 (m, 7H, ArH), δ : 7.11–7.22 (m, 13H, ArH), δ : 6.99 (d, 2H, $^3J = 8.0$ Hz, ArH), δ : 6.33–6.42 (m, 2H, ArH), δ : 6.01 (m, 1H, ArH), δ : 3.60 (dd, 4H, $^3J = 14.4$ Hz, $^4J = 6.8$ Hz, $-\text{N}-\text{CH}_2-$), δ : 1.25 (s, 2H, $-\text{CH}<$), δ : 0.86–1.05 (m, 16H, alkyl-H), δ : 0.72 (t, 6H, $^3J = 5.6$ Hz, $-\text{CH}_3$), δ : 0.46–0.57 (m, 6H, $-\text{CH}_3$)

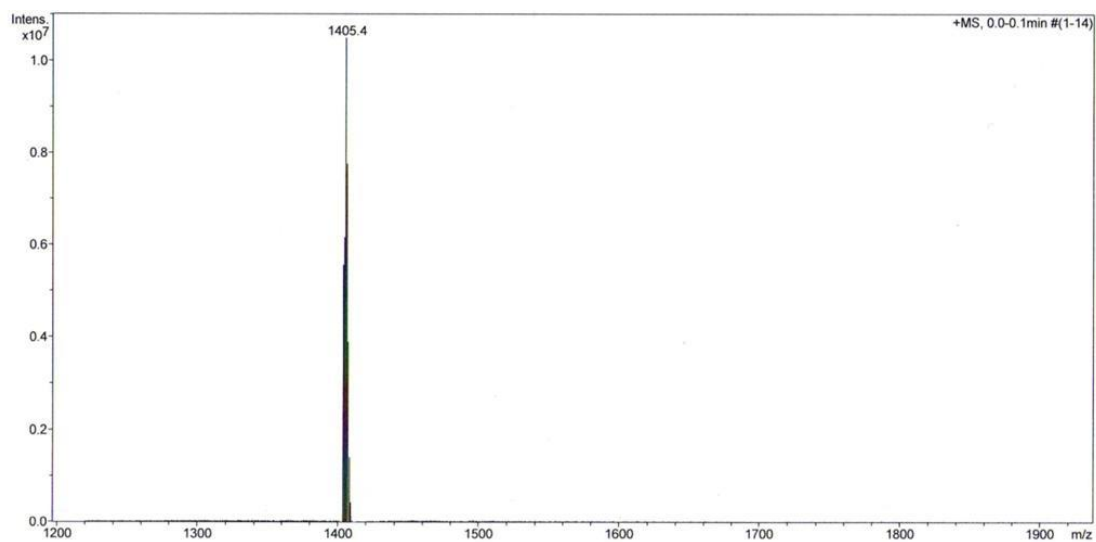


Figure S4. MS spectra of the cationic iridium(III) complex

ESI-MS(m/Z): 1405.4 [M-PF₆]⁺