

# Electronic Supplementary Information

**for**

Synthesis and Comparison Study of Electrochemiluminescence from Mononuclear  
and Corresponding Heterodinuclear Ir-Ru Complex via Amide Bond as Bridge

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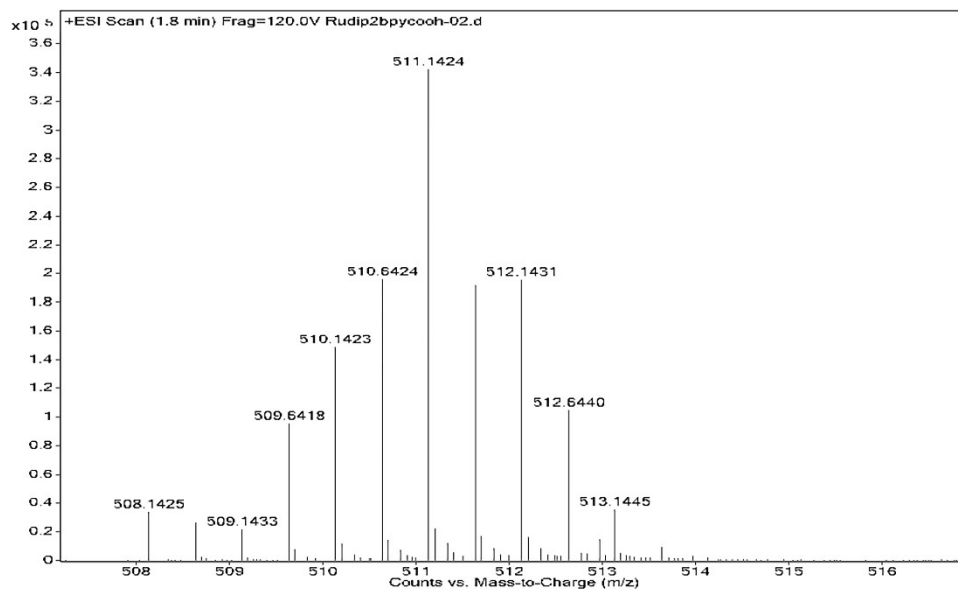


Figure S1. The high resolution mass spectrum of Ru-COOH

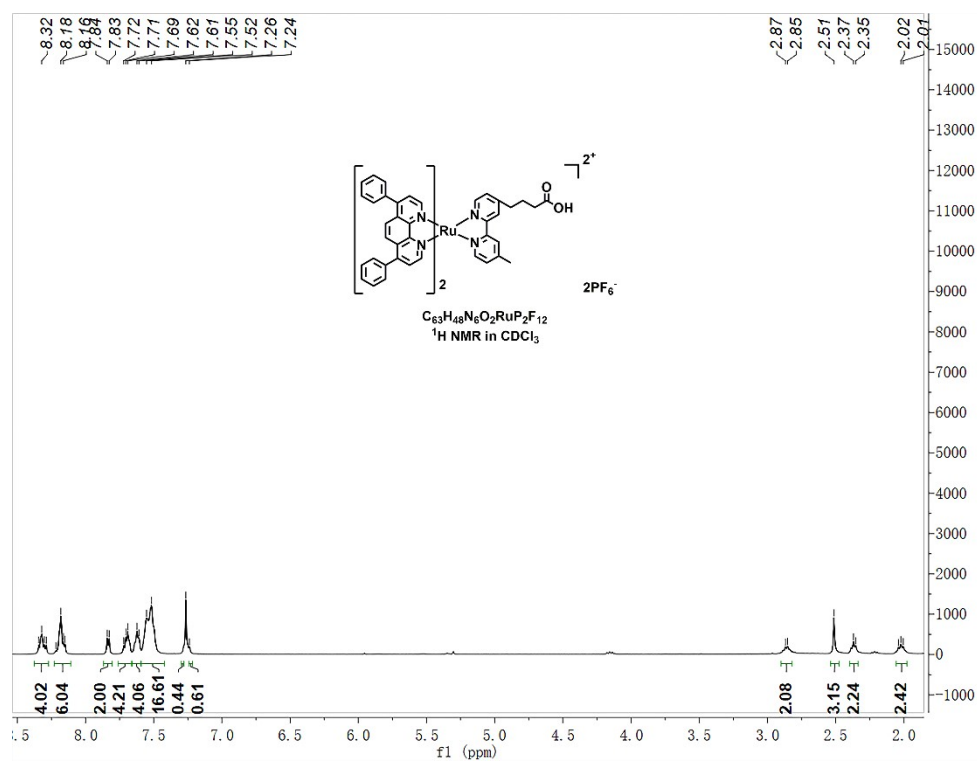


Figure S2. <sup>1</sup>H NMR spectrum of Ru-COOH in CDCl<sub>3</sub>

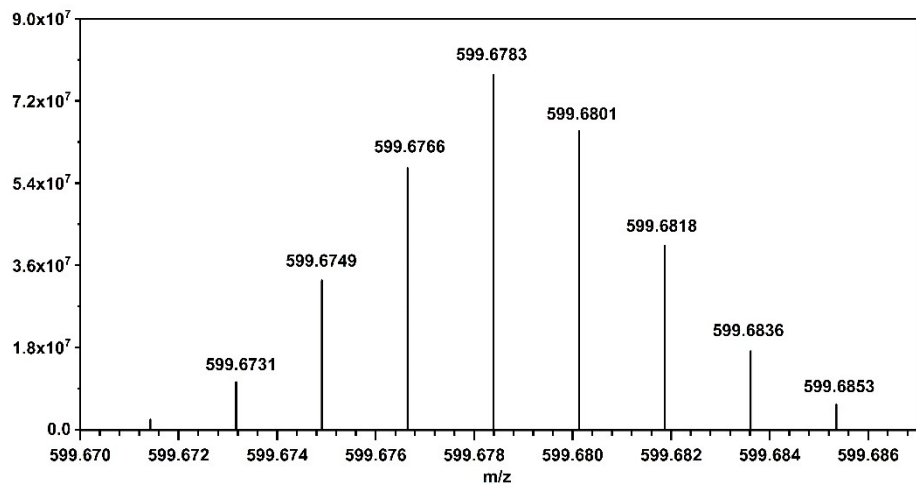


Figure S3. The high resolution mass spectrum of Ru(DIP)<sub>2</sub>(mcbpy-NH<sub>2</sub>-phen)

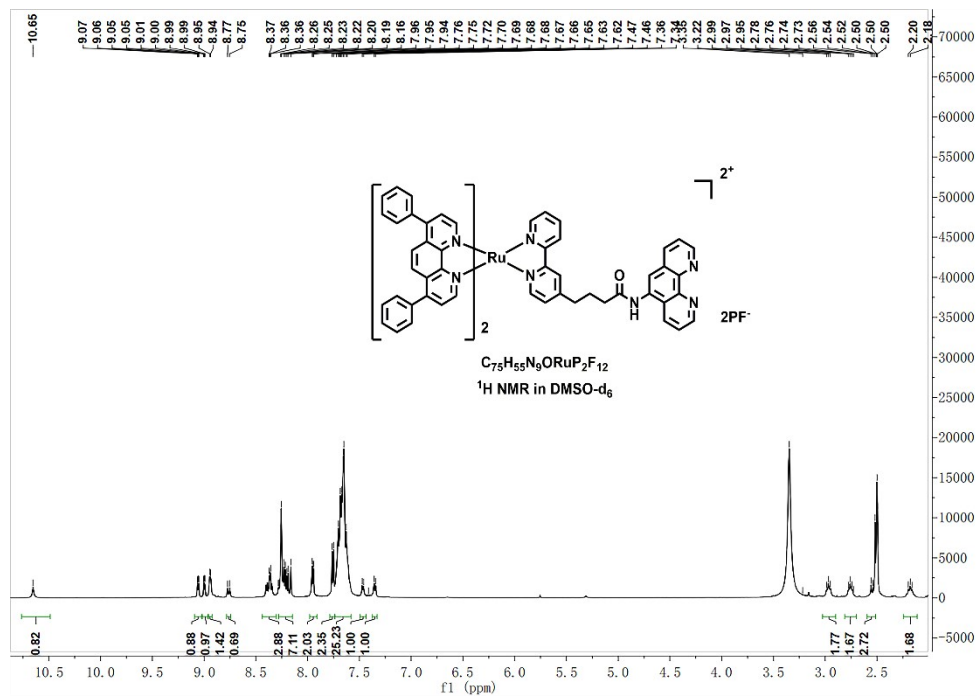
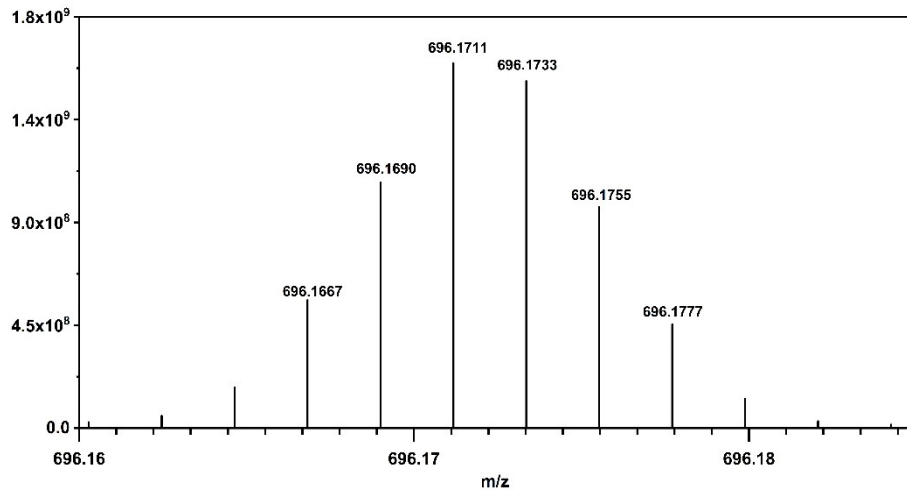
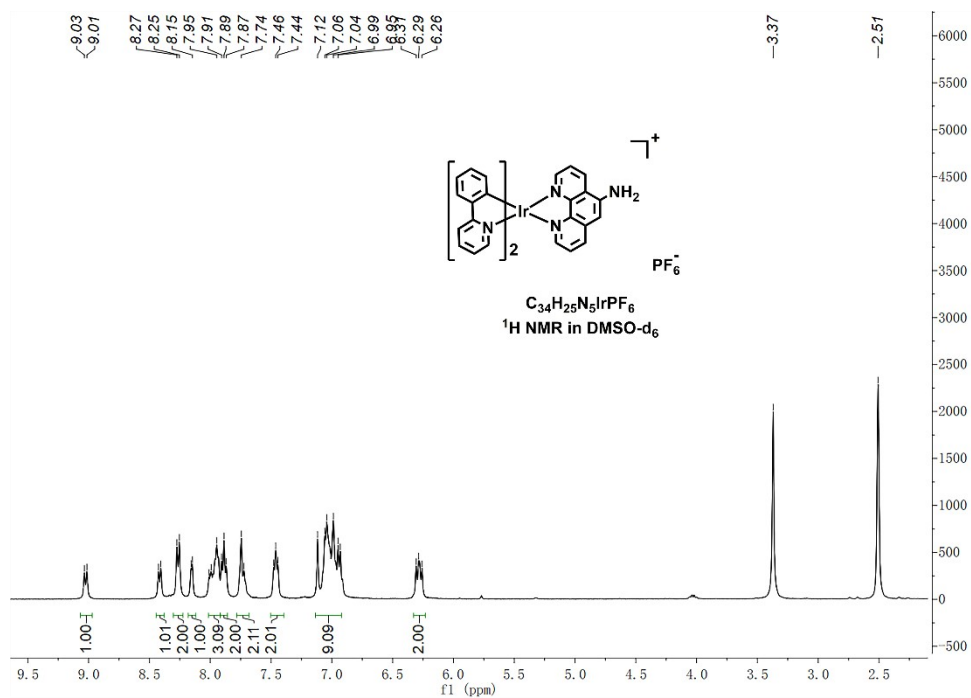


Figure S4. <sup>1</sup>H NMR spectrum of Ru(DIP)<sub>2</sub>(mcbpy-NH<sub>2</sub>-phen) in DMSO-d<sub>6</sub>



**Figure S5.** The high resolution mass spectrum of Ir-NH<sub>2</sub>



**Figure S6.** <sup>1</sup>H NMR spectrum of Ir-NH<sub>2</sub> in DMSO-d<sub>6</sub>

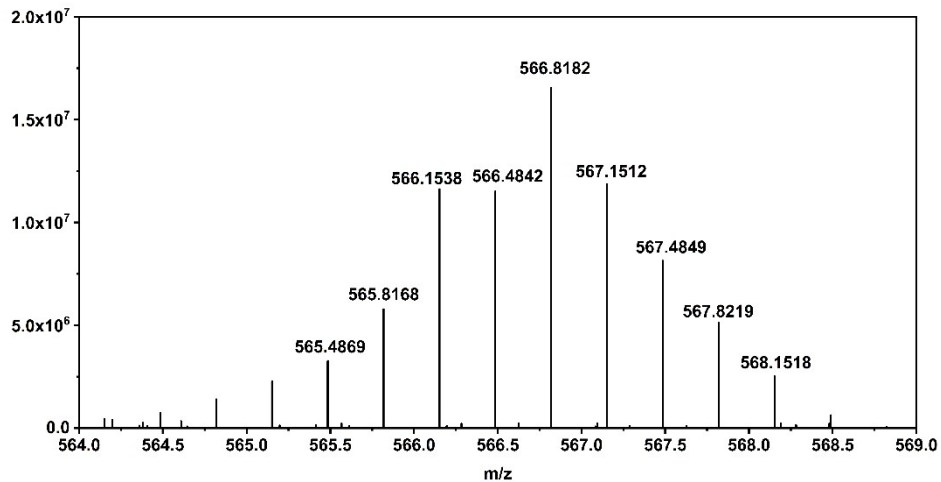


Figure S7. The high-resolution mass spectrum of Ir-Ru

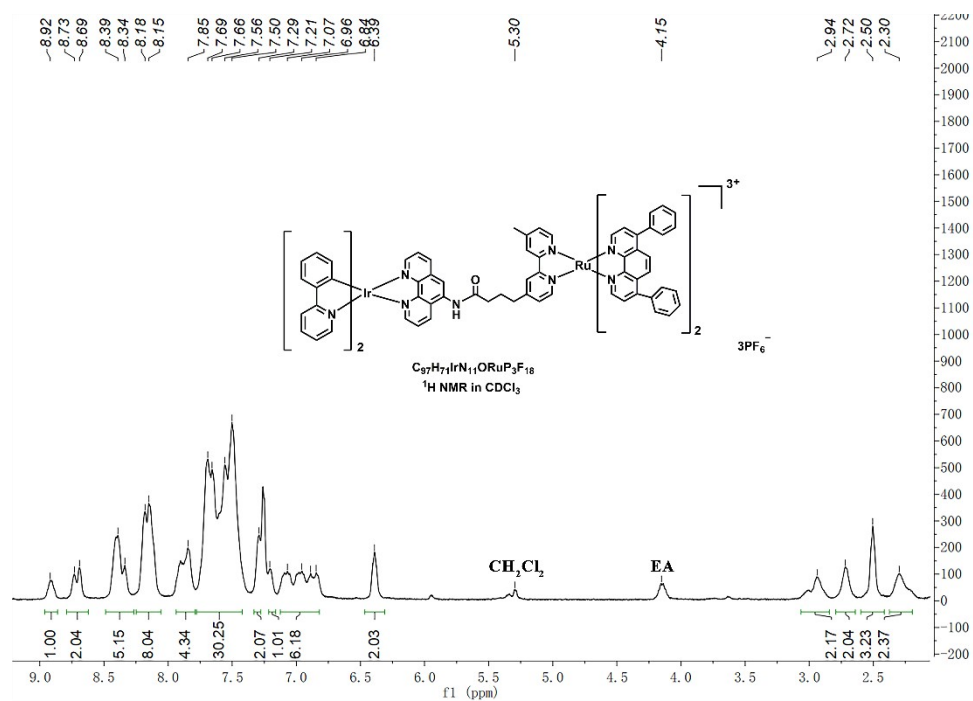


Figure S8. <sup>1</sup>H NMR spectrum of Ir-Ru in DMSO-d<sub>6</sub>

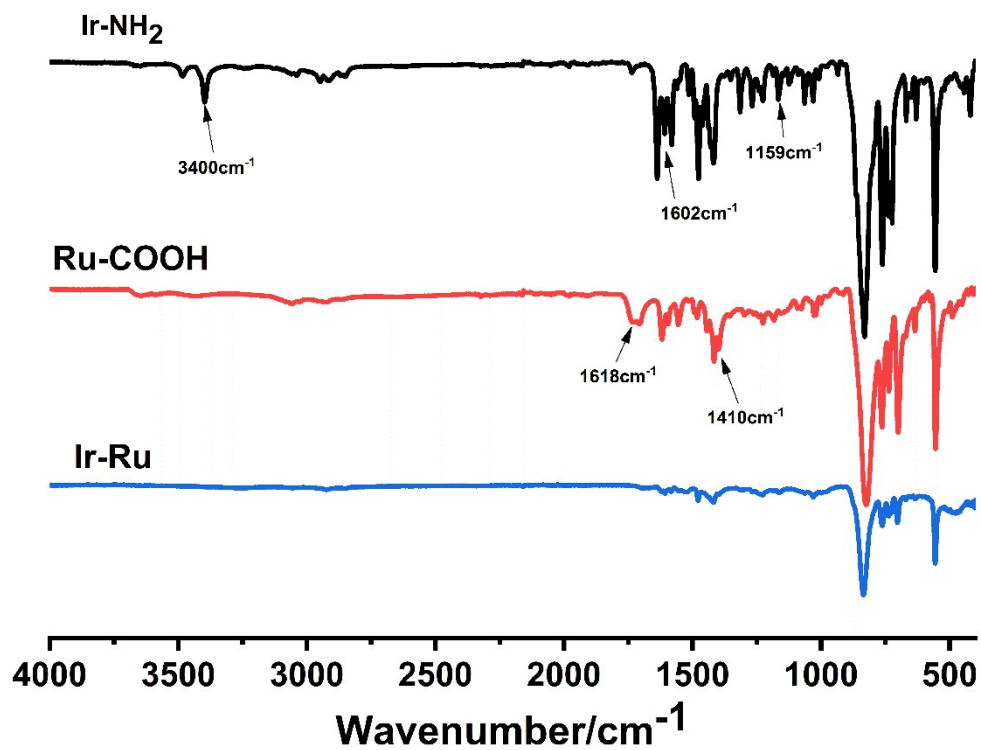


Figure S9. FT-IR spectrum of Ir-NH<sub>2</sub>, Ru-COOH, Ir-Ru

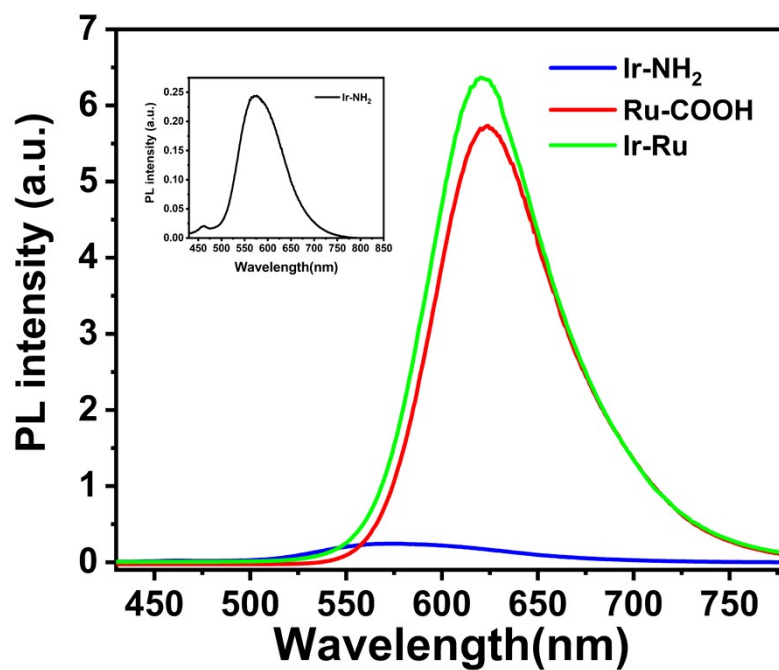
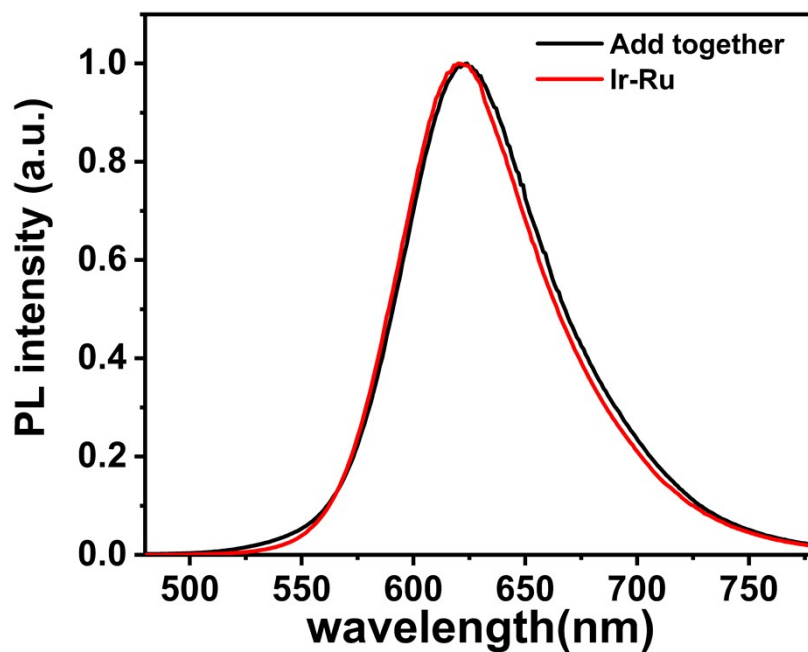
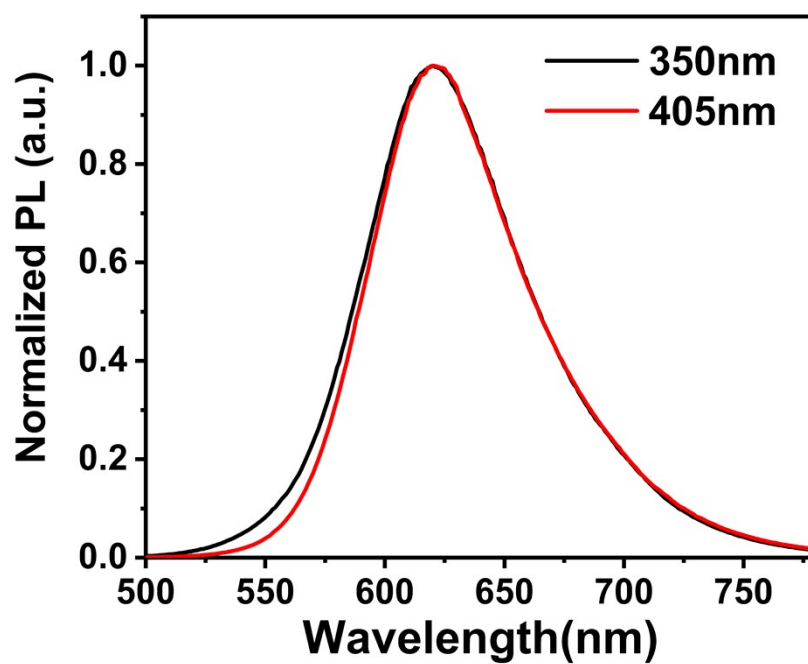


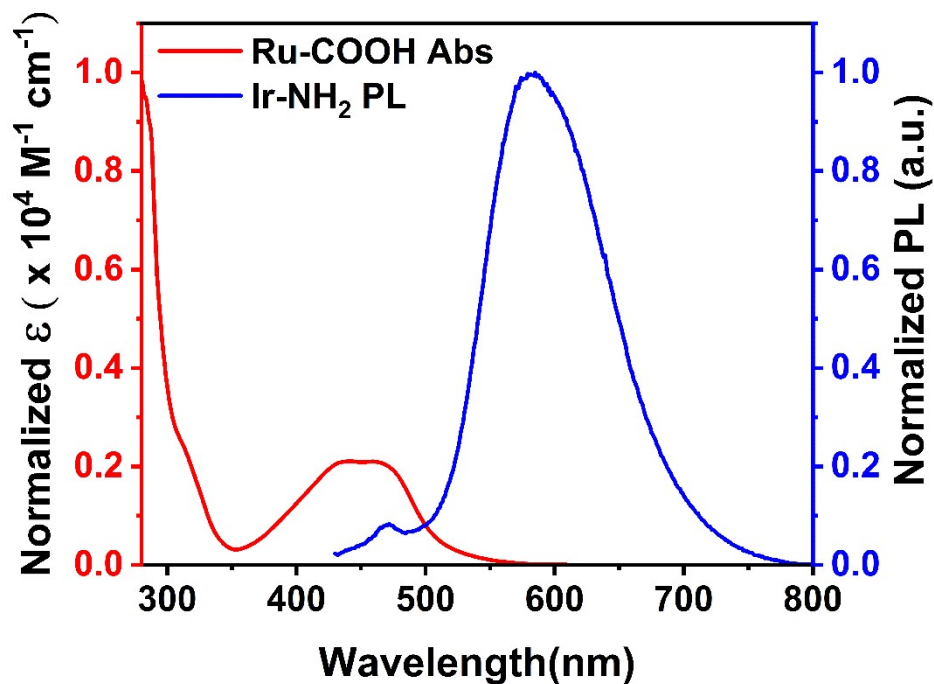
Figure S10. The original PL spectra of Ir-NH<sub>2</sub>, Ru-COOH and Ir-Ru under 405 nm excitation.



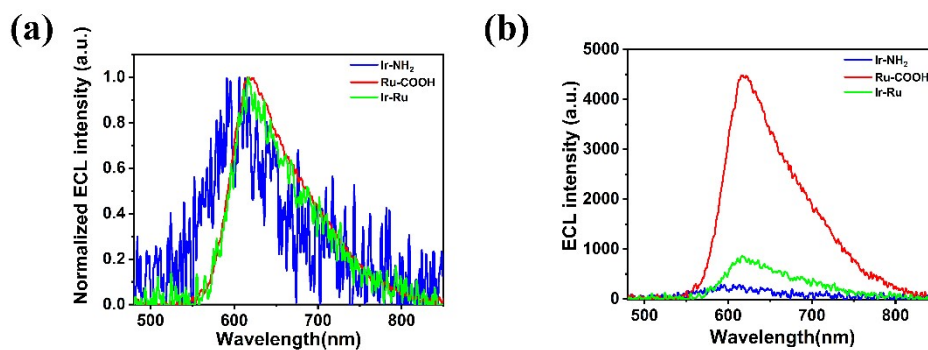
**Figure S11.** The normalized spectra of adding the PL data of Ir-NH<sub>2</sub> and Ru-COOH together and corresponding the heterodinuclear complex of Ir-Ru.



**Figure S12.** The normalized PL spectra of Ir-Ru under the excitation of 350 nm and 405 nm.

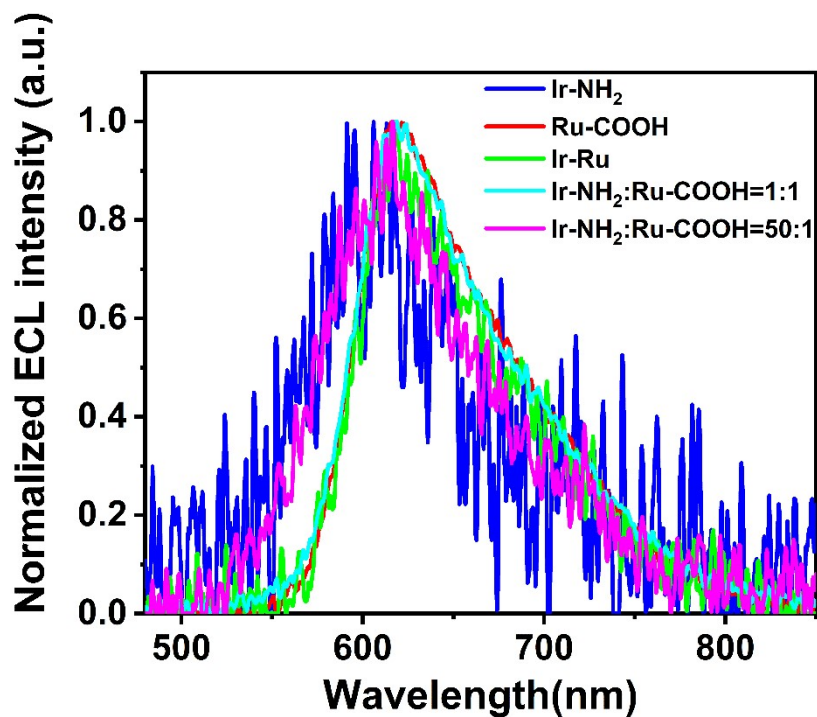


**Figure S13.** Absorption and emission spectra of the Ir-NH<sub>2</sub> and Ru-COOH

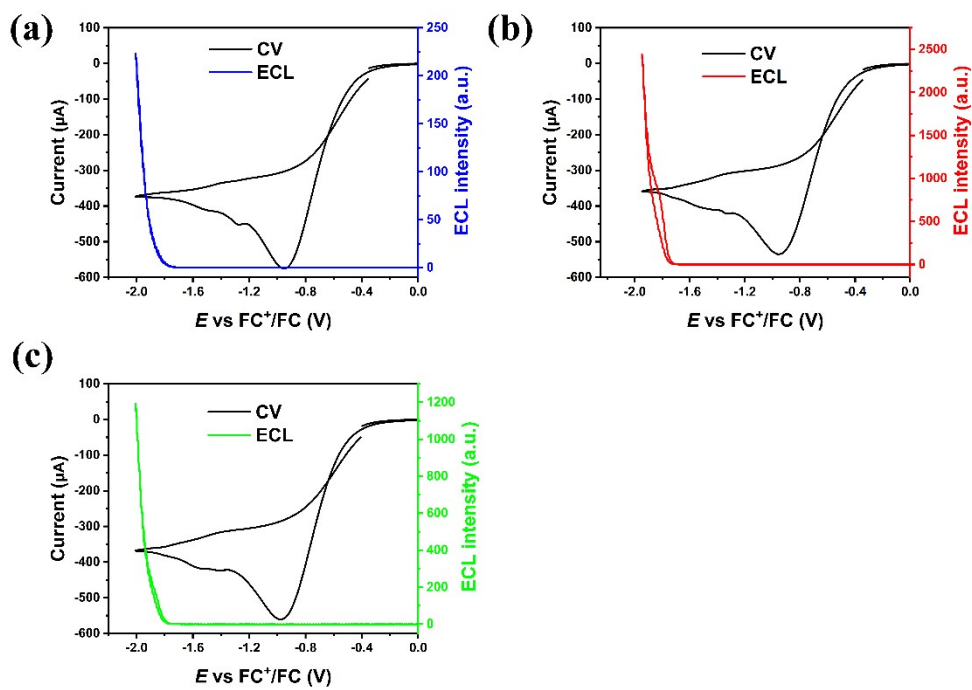


**Figure S14.** The normalized ECL spectra (a) and corresponding original data (b) for these three metal complexes in this work.

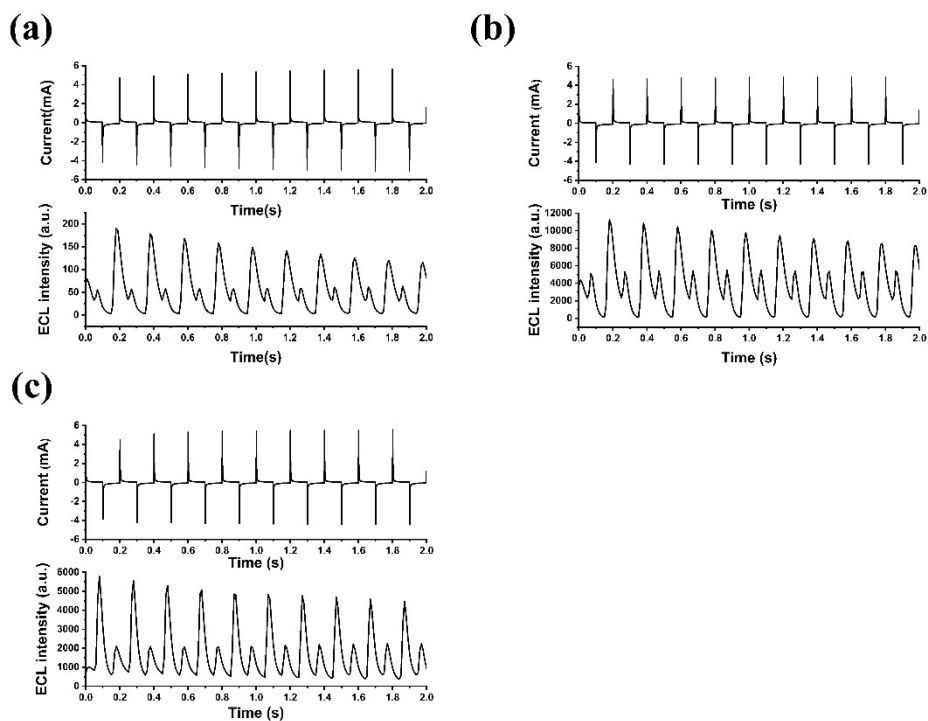




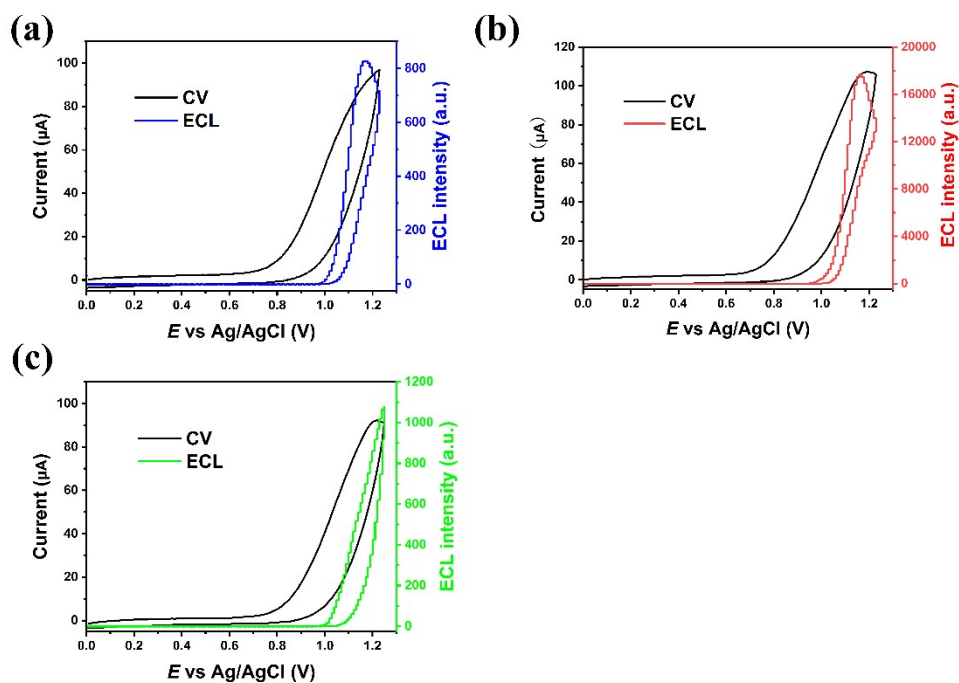
**Figure S15.** The normalized ECL spectra of three metal complexes and the mixture solution of Ir-NH<sub>2</sub> and Ru-COOH with various concentration ratios.



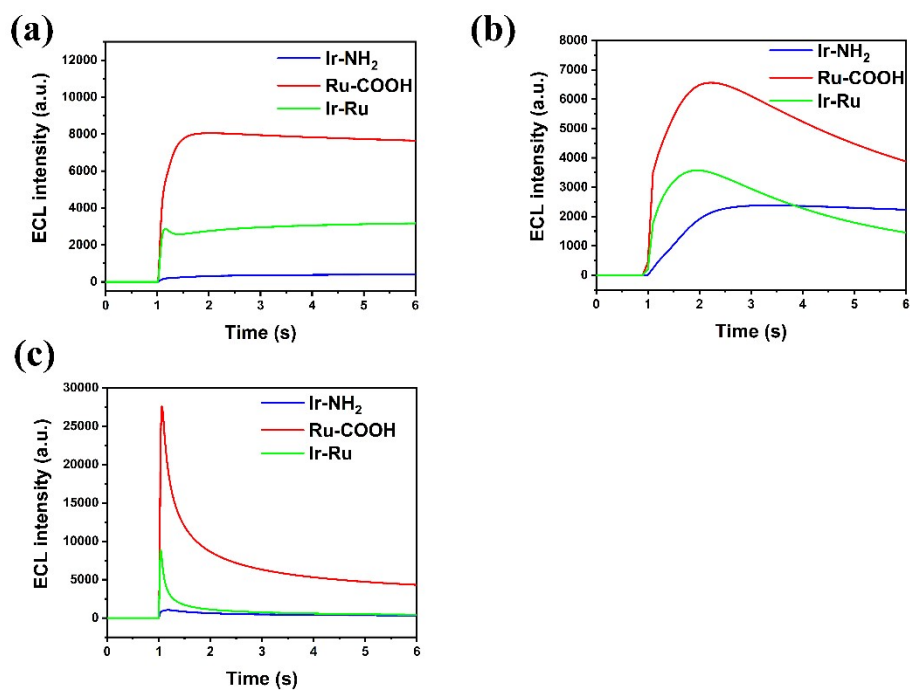
**Figure S16.** ECL intensity–potential curves overlaid with CVs dissolved in acetonitrile containing 0.1 mM complexes (a. Ir-NH<sub>2</sub> b. Ru-COOH c. Ir-Ru), 40 mM BPO and 0.1 M TBAPF<sub>6</sub>.



**Figure S17.** The annihilation ECL results (a) Ir-NH<sub>2</sub> (b) Ru-COOH (c) Ir-Ru in argon-saturated acetonitrile solution containing 0.1 mM metal complex and 0.1 M TBAPF<sub>6</sub>. The highest and lowest potential were set at 0.2 V over oxidation peak and reduction peak potential, respectively.



**Figure S18.** ECL intensity–potential curves overlaid with CVs dissolved in phosphate buffer solution (PBS, 0.1M, pH 7.4) containing 0.1 mM complexes (a. Ir-NH<sub>2</sub> b. Ru-COOH c. Ir-Ru) and 40 mM TPA.



**Figure S19.** ECL intensity–time curves under the potential stepping methods: a) 0.1 mM metal complex, 40 mM TPA, 0.1M TBAPF<sub>6</sub> in acetonitrile solution; b) 0.1 mM metal complex, 40 mM TPA, 0.1M TBAPF<sub>6</sub> in acetonitrile solution; c) 0.1 mM metal complex, 40 mM TPA, 0.1M TBAPF<sub>6</sub> in acetonitrile solution.

mM BPO, 0.1M TBAPF6 in acetonitrile solution; c) a) 0.1 mM metal complex, 40 mM TPA in PBS (0.1 M, pH 7.4).