

Electronic Supplementary Information

New platinum and ruthenium Schiff base complexes for water splitting reactions

Chuanjun Wang,^a Yong Chen,^a and Wen-Fu Fu^{*a,b}

^a *Key Laboratory of Photochemical Conversion and Optoelectronic Materials and HKU-CAS Joint Laboratory on New Materials, Technical Institute of Physics and Chemistry and University of Chinese Academy of Sciences, CAS, Beijing, 100190, People's Republic of China*

^b *College of Chemistry and Engineering, Yunnan Normal University, Kunming, 650092, People's Republic of China*

E-mail: fuwf@mail.ipc.ac.cn

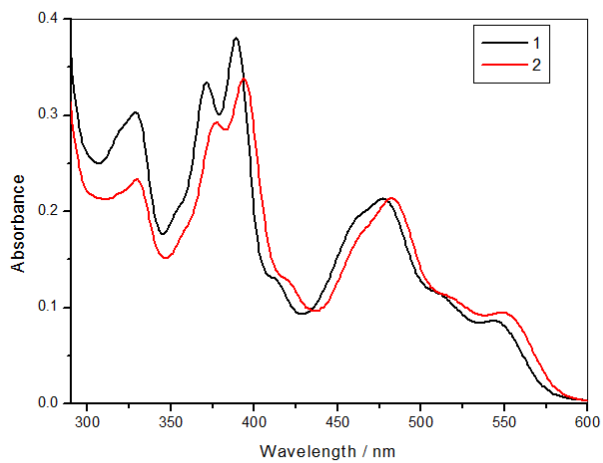


Figure S1. UV-vis absorption spectra of complexes **1** and **2** in degassed DMF (1.0×10^{-5} M) solution at room temperature.

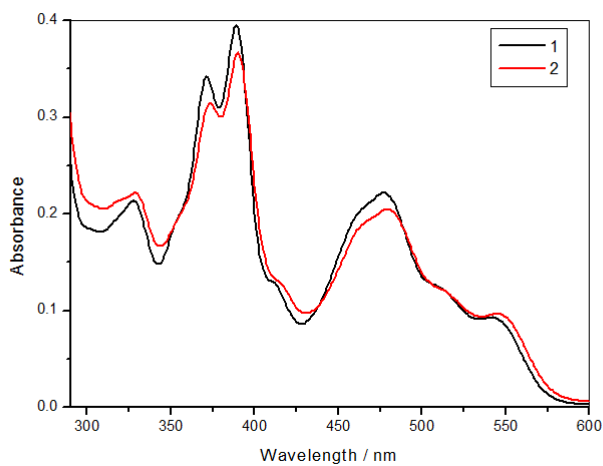


Figure S2. UV-vis absorption spectra of complexes **1** and **2** in degassed DMF/H₂O (9:1) mixed solvents (1.0×10^{-5} M).

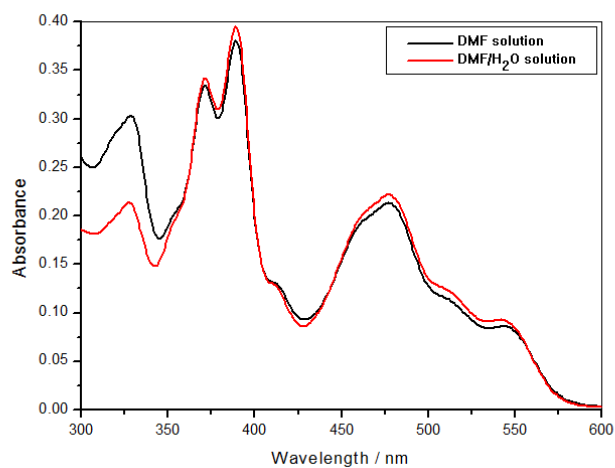


Figure S3. UV-vis absorption spectra of complex **1** in DMF and DMF/H₂O (9:1) mixed solvents (1.0×10^{-5} M).

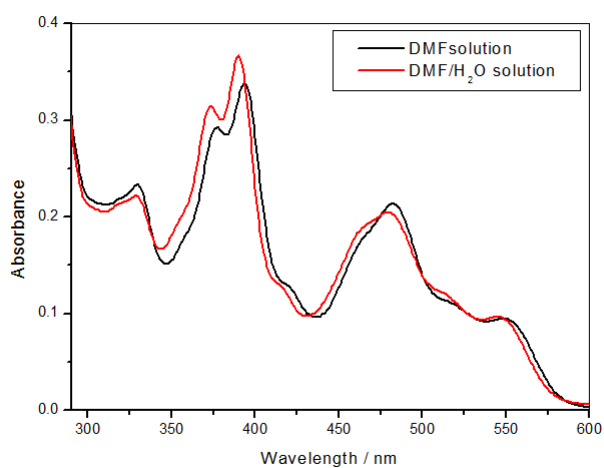


Figure S4. UV-vis absorption spectra differences of complex **2** in DMF and DMF/H₂O (9:1) mixed solvents (1.0×10^{-5} M).

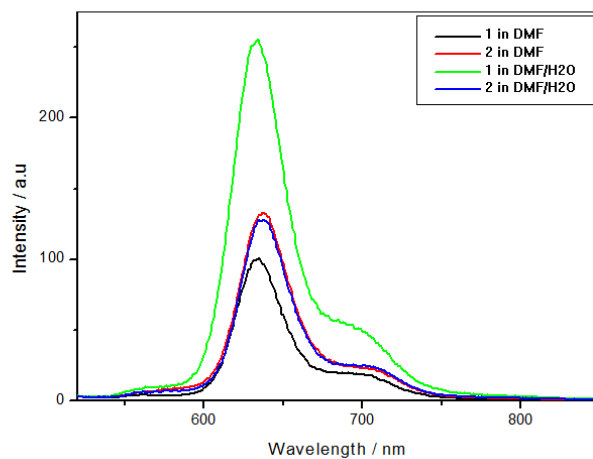


Figure S5. Emission spectra of complexes **1** and **2** in air-saturated DMF and DMF/H₂O (9:1) mixed solution (1.0×10^{-5} M) at room temperature, excitation upon 480 nm.

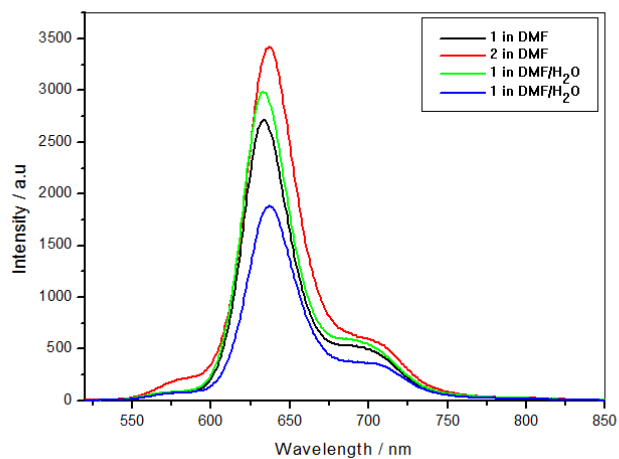


Figure S6. Emission spectra of complexes **1** and **2** in degassed DMF and DMF/H₂O (9:1) mixed solution (1.0×10^{-5} M) at room temperature, excitation upon 480 nm.

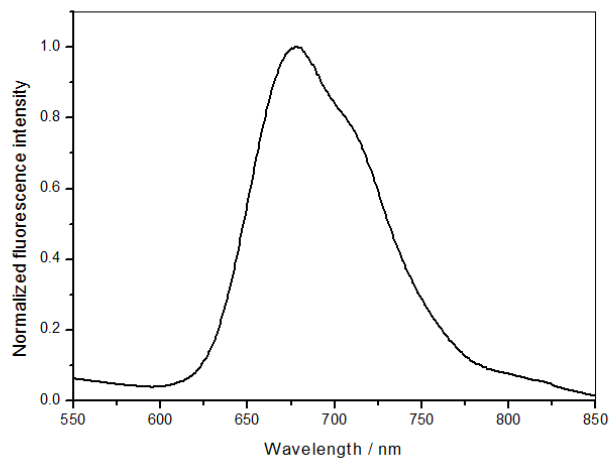


Figure S7. Emission spectrum of complex **1** in solid state at room temperature, excitation upon 480 nm.

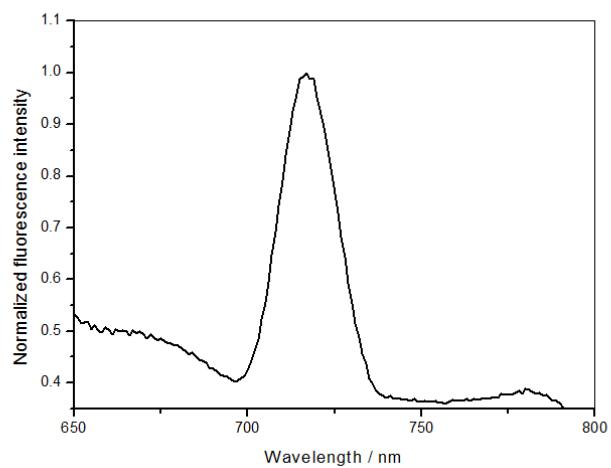


Figure S8. Emission spectrum of complex **2** in solid state at room temperature, excitation upon 480 nm.

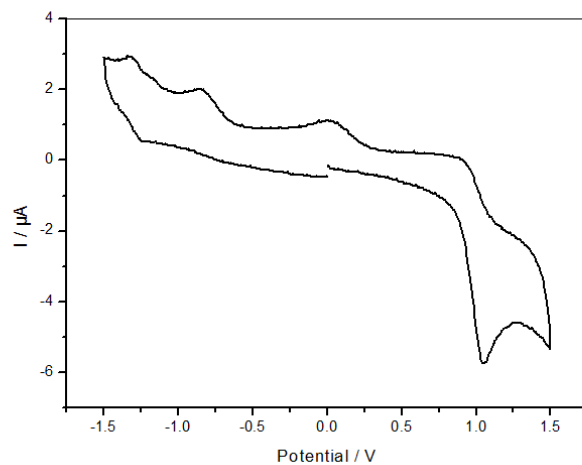
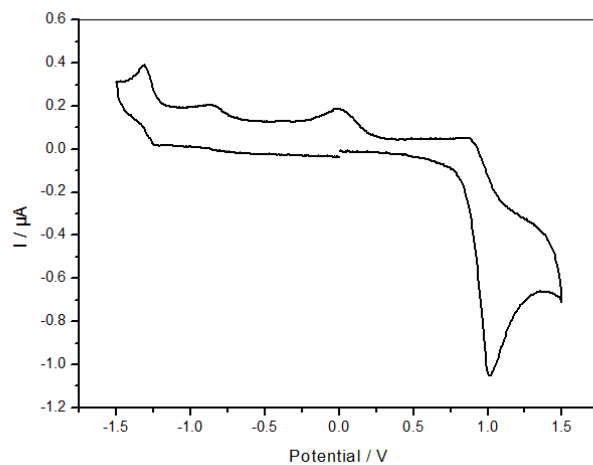


Figure S9. Cyclic voltammetric curves of complexes **1** (up) and **2** (down) , sample concentration is 1.0×10^{-4} M in 0.1M n-Bu₄NPF₆/DMF, scan rate 100 mV s⁻¹ at room temperature, working electrode: glassy carbon, counter electrode: Pt foil; reference electrode: saturated calomel electrode (SCE). Potential in V vs. SCE.

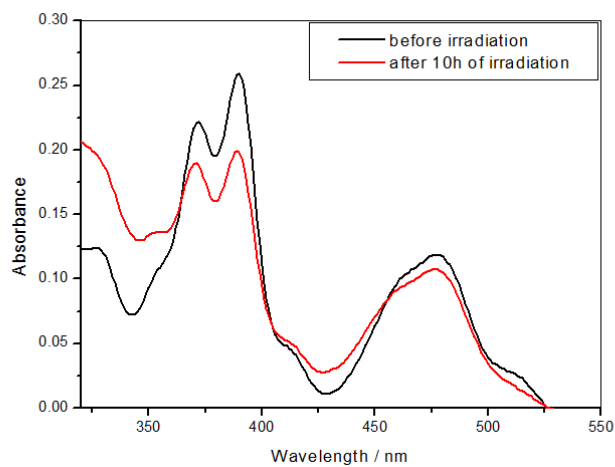


Figure S10. Optical absorption spectral changes of complex **1** (1.0×10^{-5} M) containing K_2PtCl_4 aqueous solution (3.0×10^{-5} M), TEA (0.86 M) before irradiation and after 10 h of irradiation.

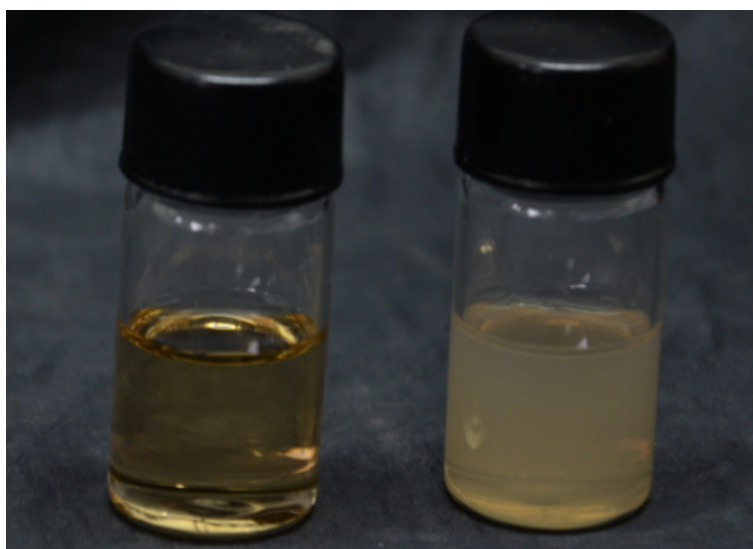


Figure S11. Images of the 12 h reaction solutions of complex **2** in the absence (left) and presence(right) of TiO_2 used for absorbance and fluorescence tests.

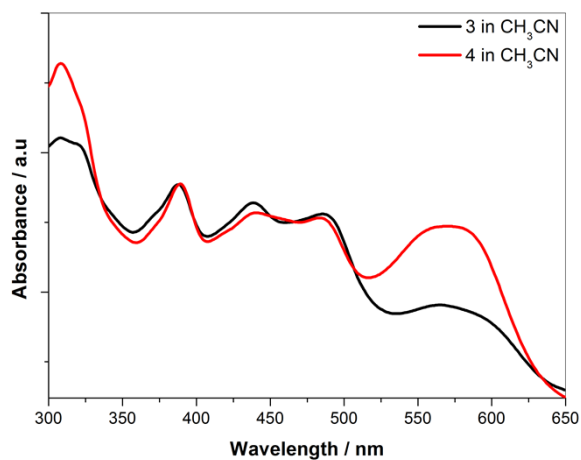


Figure S12. UV-vis profiles of complexes **3** and **4** in CH_3CN (5.0×10^{-5} M).

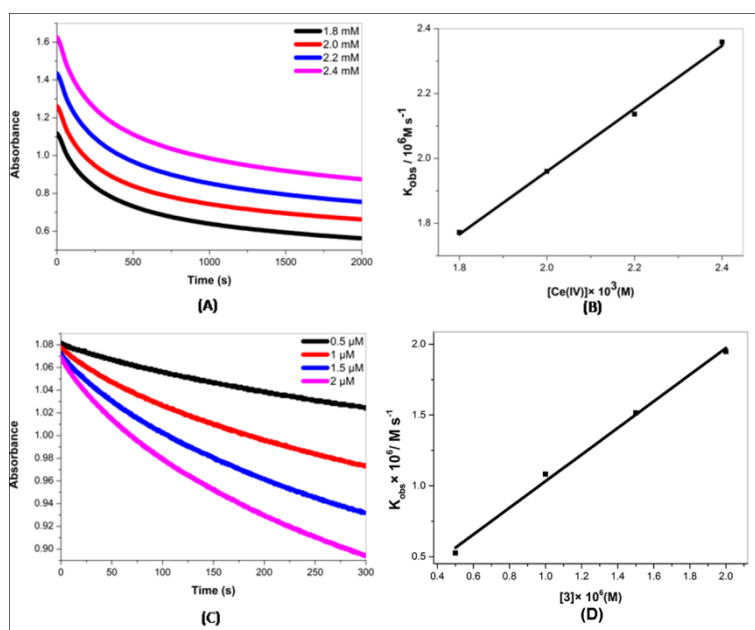


Figure S13. (A) Absorption spectral changes of CAN at 360 nm after mixing complex **3** (0.01 mM) with various concentrations of CAN aqueous solution, no data were collected in the first 12 s due to injecting CAN and shaking cell. (B) Plots of initial rate k_{obs} calculated by linear fitting the data from 0 to 300 s in the upper portion versus $[\text{Ce}^{4+}]$, CAN loss is first order in ACN with a first-order rate constant of $1.0 \times 10^{-3} \text{ s}^{-1}$. (C) Monitoring CAN decay at 360 nm after the addition of complex **3** (0.5, 1.0, 1.5, 2.0 μM). (D) Plots of k_{obs} versus $[\mathbf{3}]$, the initial rates k_{obs} were calculated by linear fitting the data from 0 to 60 s, CAN loss is first order in **3** with a first-order rate constant of 0.87 s^{-1} .

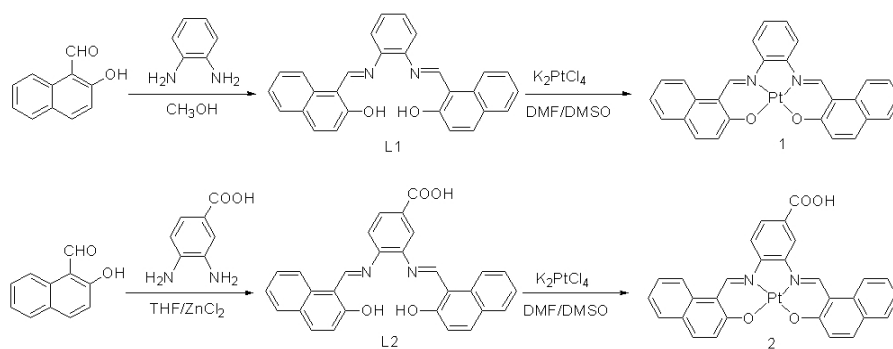


Figure S14. Preparation procedures of complex 1 and complex 2.

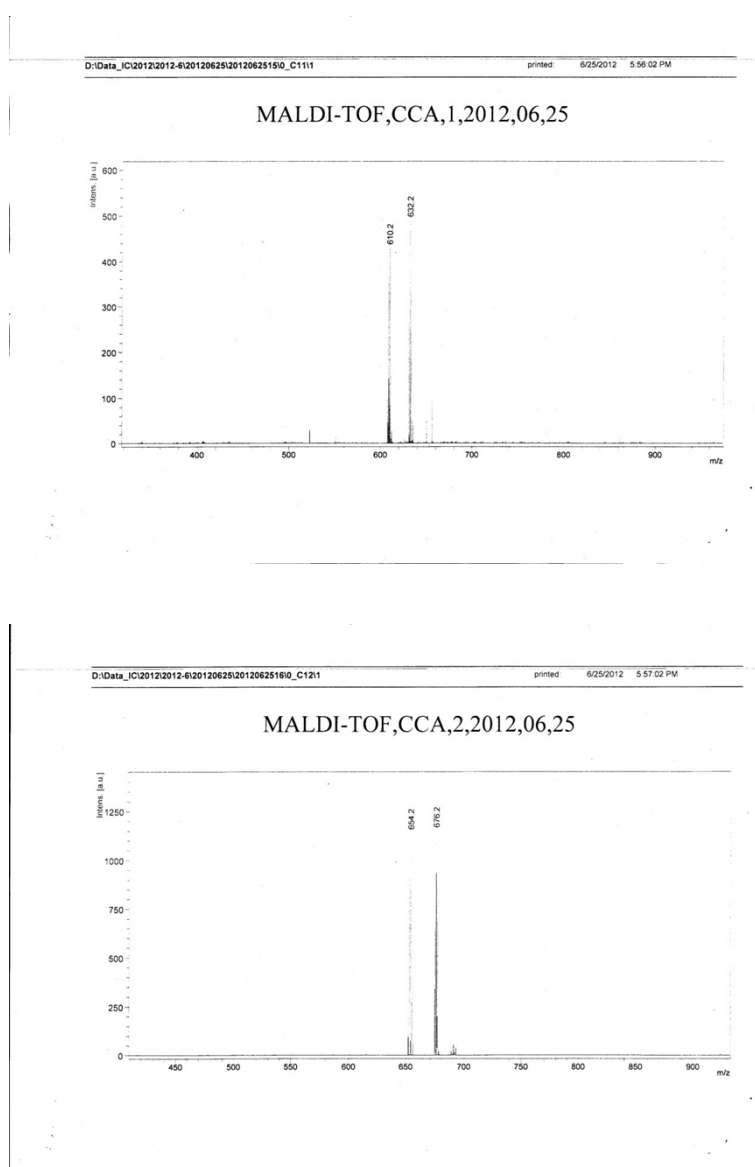


Figure S15. MALDI-TOF mass spectrum of complex 1 (up, 610.2 $[M + H]^+$; 632.2 $[M + Na]^+$) and complex 2 (down, 654.2 $[M + H]^+$; 676.2 $[M + Na]^+$).

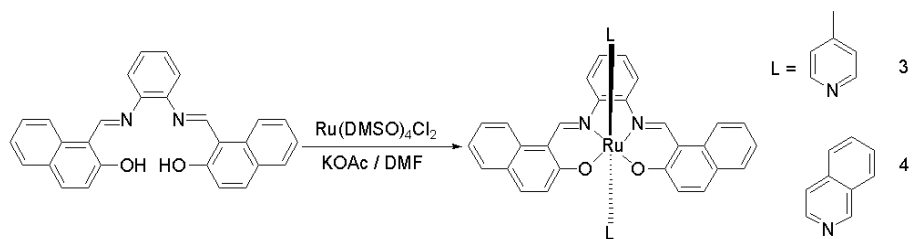


Figure S16. Preparation procedure of complexes **3** and **4**.

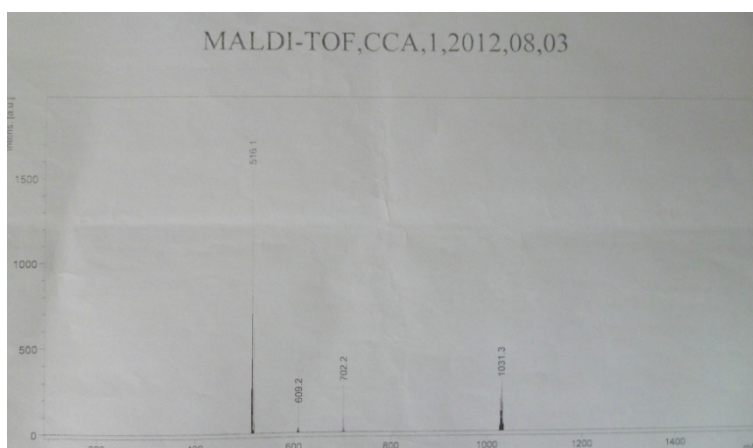
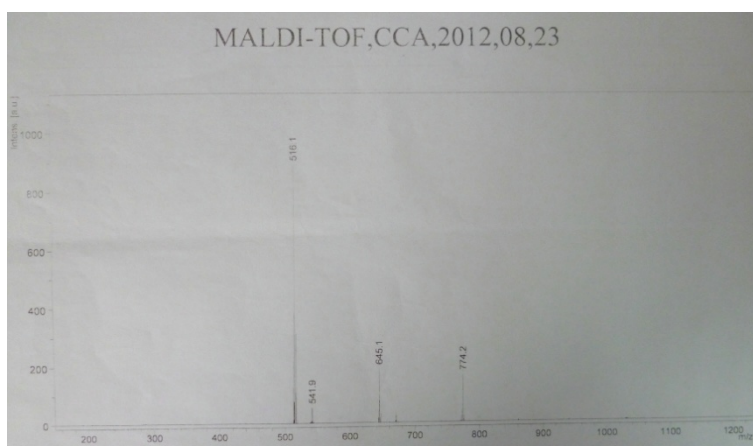


Figure S17. MALDI-TOF of complexes **3** (up) and **4** (down).

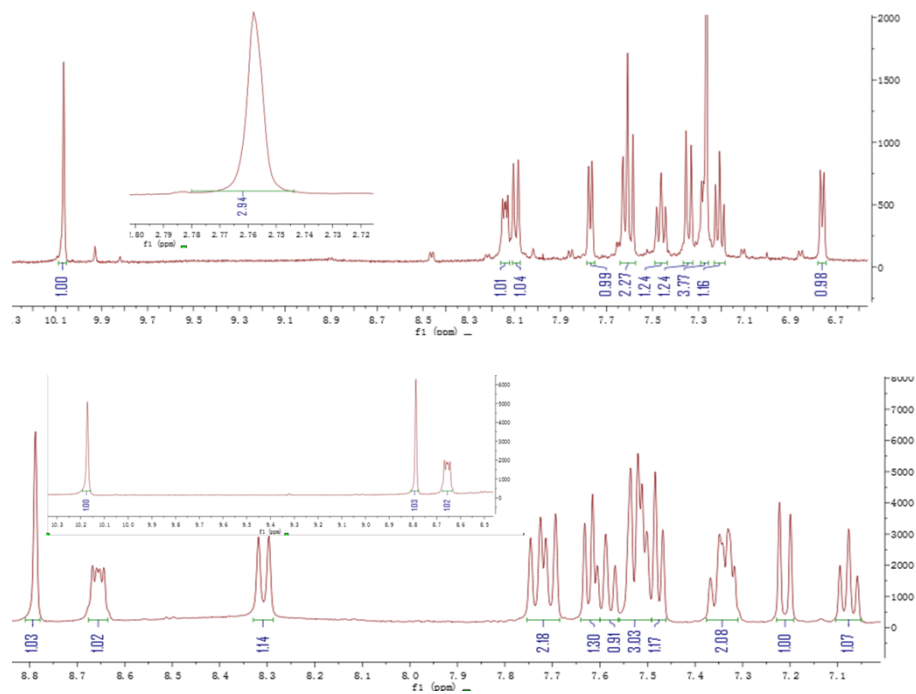
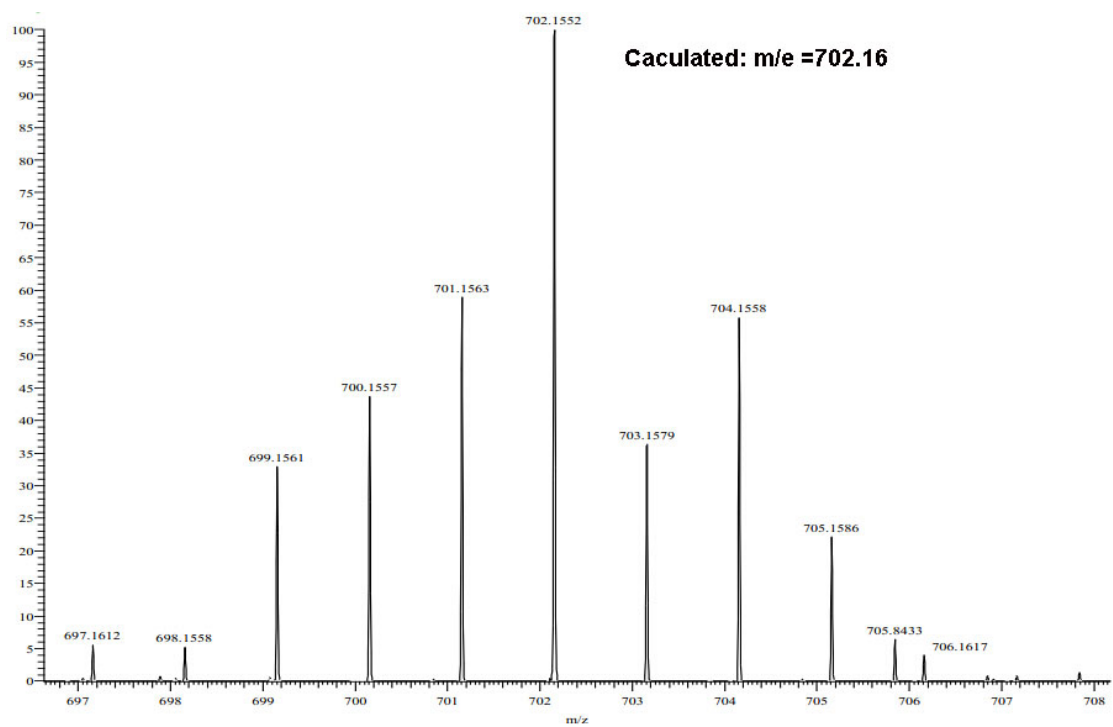


Figure S18. ¹H NMR spectra of complexes **3** in CDCl₃ (up) and **4** in d⁶-DMSO (down).



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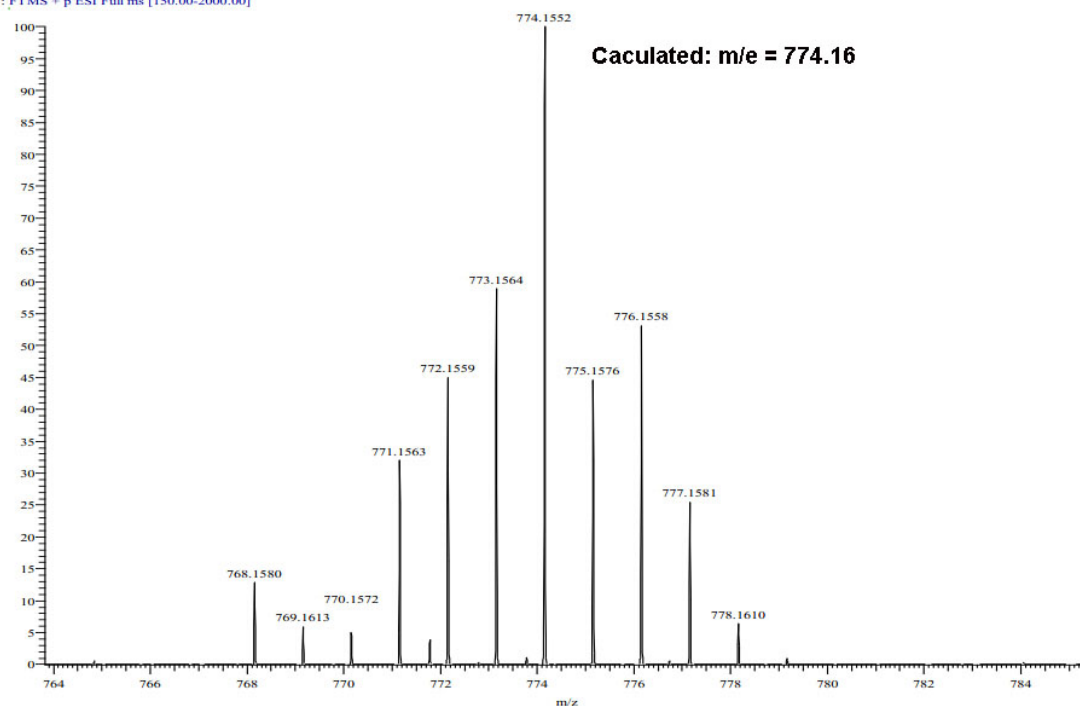


Figure S19. HRMS spectra of complexes **3** (up) and **4** (down) in CH_3CN and H_2O .