Electronic Supplementary Material (ESI) for Photochemical & Photobiological Sciences.

Mono- and di-nuclear Re(I) complexes and the role of protonable nitrogen atom on quenching emission process by hydroquinone

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Supplementary Information

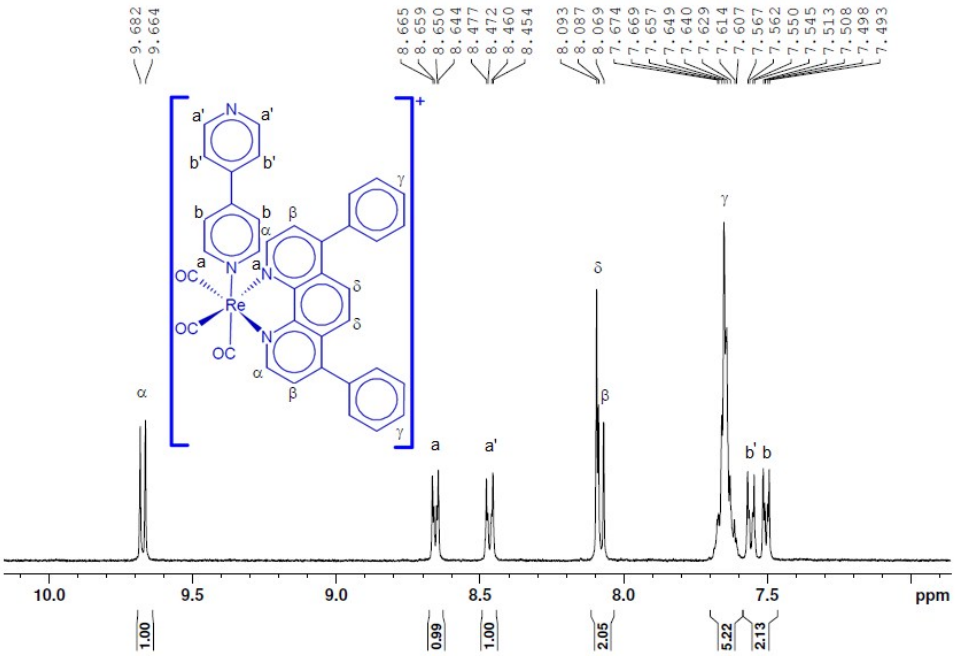


Figure S1: ^{1}H NMR spectrum of *fac*-[Re(CO)$_3$(ph$_2$phen)(4,4'-bpy)]$^+$ in CD_3CN at 25°C (300MHz).

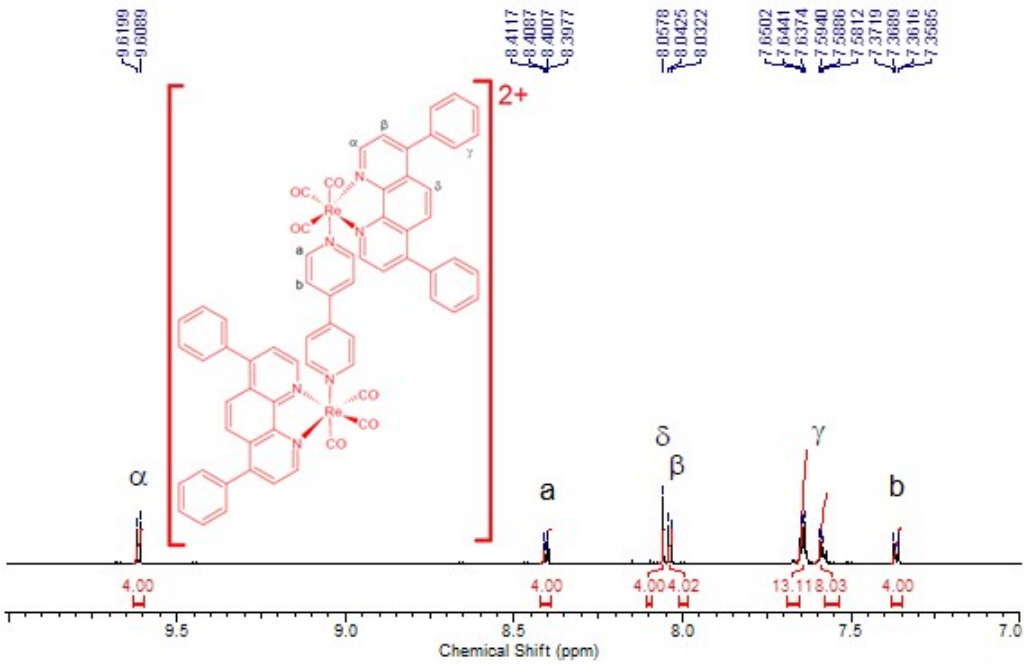
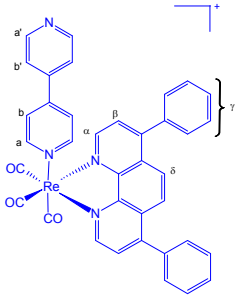
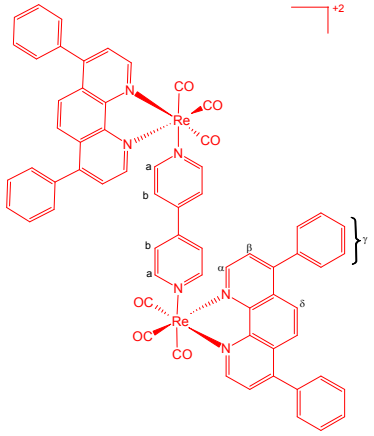


Figure S2: ^{1}H NMR spectrum of $[\{(ph_2phen)(CO)_3Re\}_2(4,4'\text{-bpy})]^{2+}$ in CD_3CN at 25°C (500MHz).

Table S1. ^{1}H NMR spectral data for rhenium(I) complexes in CD_3CN (300 or 500 MHz).

Compound	Proton	δ (ppm)	J (Hz)
	H_α	9.67 (d,2H)	5.4
	H_β	8.07 (d, 2H)	5.4
	H_δ	8.09 (s, 2H)	
	H_γ	7.65 (m, 10H)	
	H_a	8.65 (dd, 2H)	4.5; 1.8
	$H_{a'}$	8.46 (dd, 2H)	5.2; 1.7
	H_b	7.55 (dd, 2H)	4.5; 1.5
	$H_{b'}$	7.50 (dd, 2H)	5.1; 1.5
	H_α	9.61 (d, 4H)	5.5
	H_β	8.04 (d, 4H)	5.2
	H_δ	8.06 (s, 4H)	
	H_γ	7.64-7.59 (m, 20H)	
	H_a	8.40 (dd, 4H)	5.5; 1.5
	H_b	7.36 (dd, 4H)	5.2; 1.5

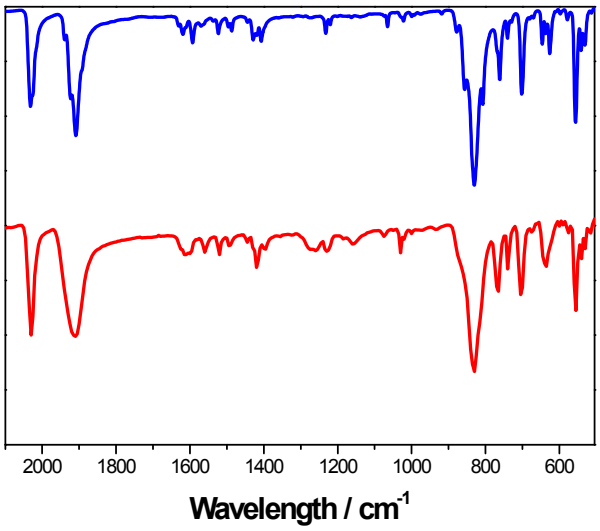


Figure S3: FTIR spectra of *fac*-[$Re(CO)_3(ph_2phen)(4,4'\text{-bpy})]PF_6$ (—) and $[\{(ph_2phen)(CO)_3Re\}_2(4,4'\text{-bpy})](PF_6)_2$ (—).

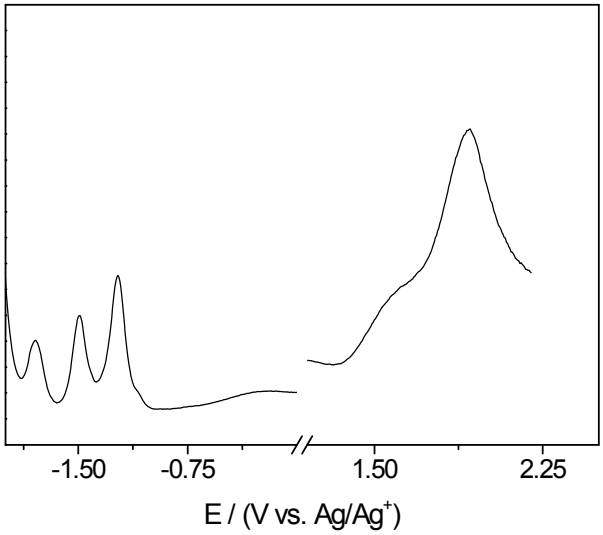


Figure S4: Differential pulse voltammogram of *fac*-$[Re(CO)_3(ph_2phen)(4,4'\text{-bpy})]^+$ in acetonitrile solution (0.1 M $LiClO_4$).

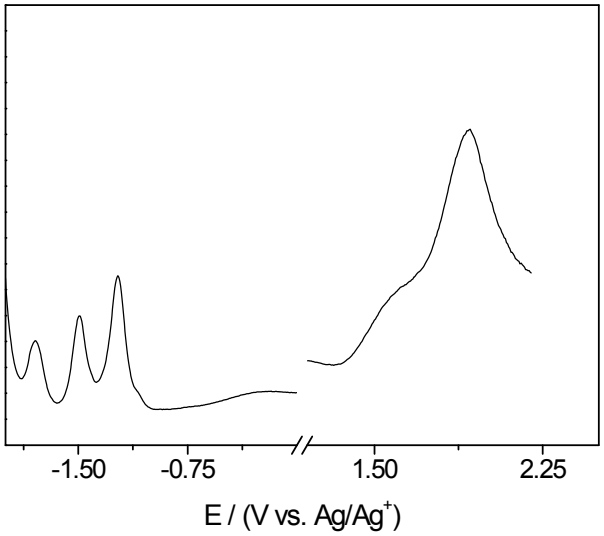


Figure S5: Differential pulse voltammogram of $[\{(ph_2phen)(CO)_3Re\}_2(4,4'\text{-bpy})]^{2+}$ in acetonitrile solution (0.1 M $LiClO_4$).

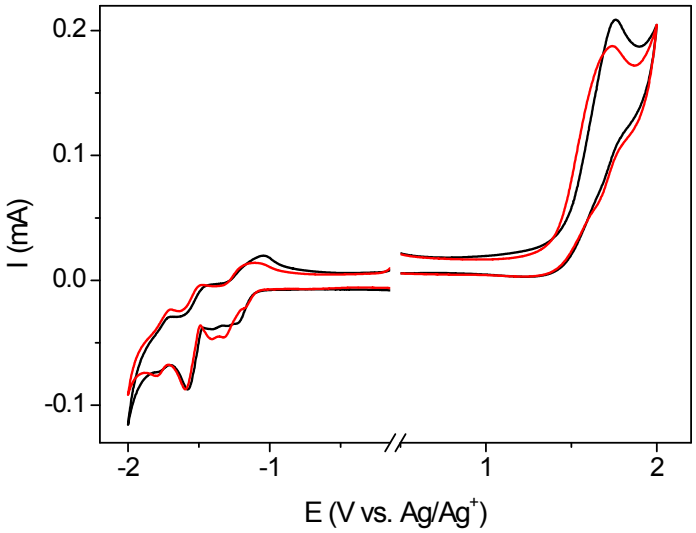


Figure S6: Cyclic voltammogram of mono-nuclear *fac*-$[Re(CO)_3(ph_2phen)(4,4'\text{-bpy})]^+$ (-) and of di-nuclear $[\{(ph_2phen)(CO)_3Re\}_2(4,4'\text{-bpy})]^{+2}$ (-) in acetonitrile solution (0.1 M $LiClO_4$) and scan rate: 100 $mV.s^{-1}$.

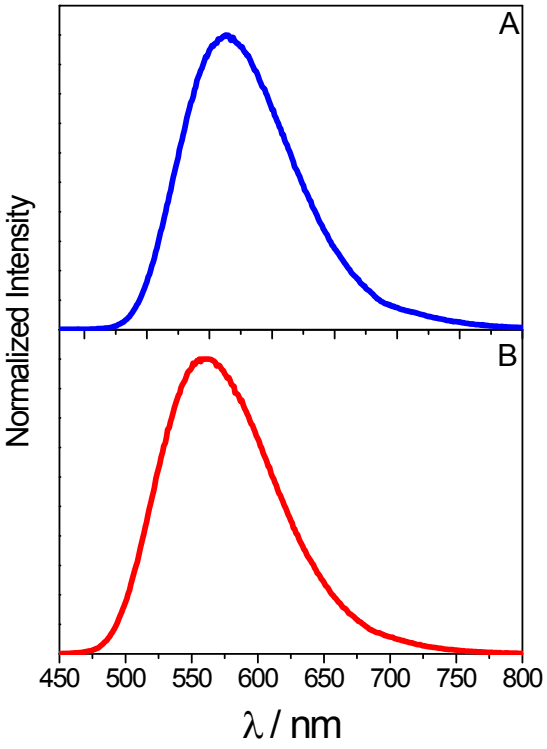


Figure S7. Emission spectra of mononuclear *fac*-$[Re(CO)_3(ph_2phen)(4,4'\text{-bpy})]^+$ (A) and of dinuclear $[\{(ph_2phen)(CO)_3Re\}_2(4,4'\text{-bpy})]^{+2}$ (B) complexes in CH_3CN at 298 K.

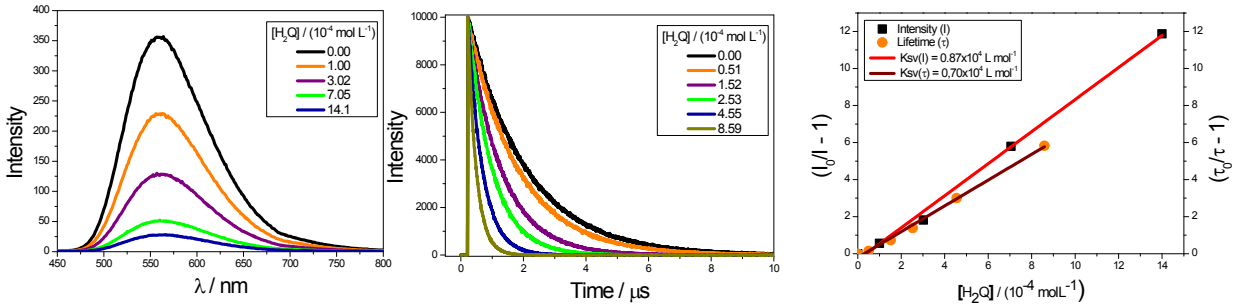


Figure S8: Emission spectra, luminescence decay and Stern-Volmer plots of $[\{(ph_2phen)(CO)_3Re\}_2(4,4'\text{-bpy})]^{2+}$ in CH_3CN in the presence of different concentrations of hydroquinone at 298 K.

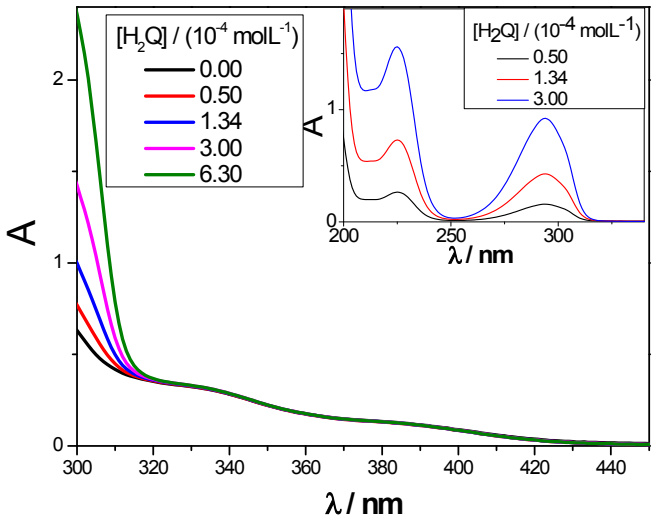


Figure S9: Absorption spectra of *fac*-$[Re(CO)_3(ph_2phen)(4,4'\text{-bpy})]^+$ in CH_3CN in the presence of different concentrations of hydroquinone at 298 K. Inset: Absorption spectra of hydroquinone in CH_3CN at 298 K in three different concentration.

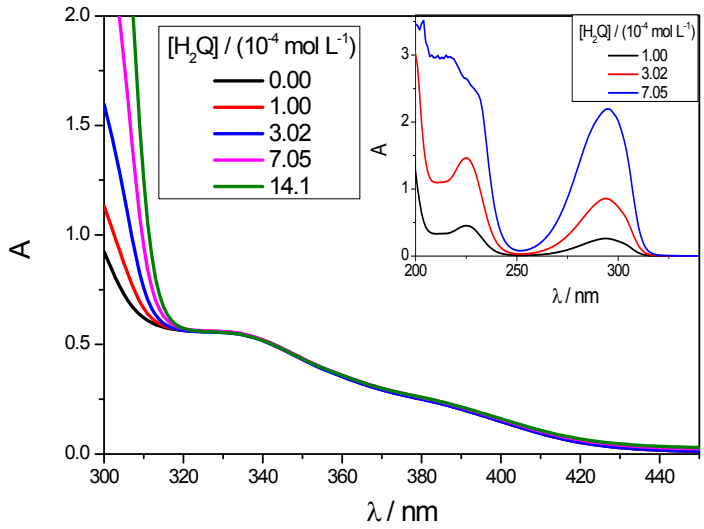


Figure S10: Absorption spectra of $[\{(ph_2phen)(CO)_3Re\}_2(4,4'\text{-bpy})]^{2+}$ in CH_3CN in the presence of different concentrations of hydroquinone at 298 K. Inset: Absorption spectra of hydroquinone in CH_3CN at 298 K in three different concentration.