Electronic Supplementary Information

Title: A novel cationic iridium(III) complex with a thiorhodamine-based auxiliary ligand:

Application for luminescent and colorimetric detection of Hg^{2+} in aqueous solution

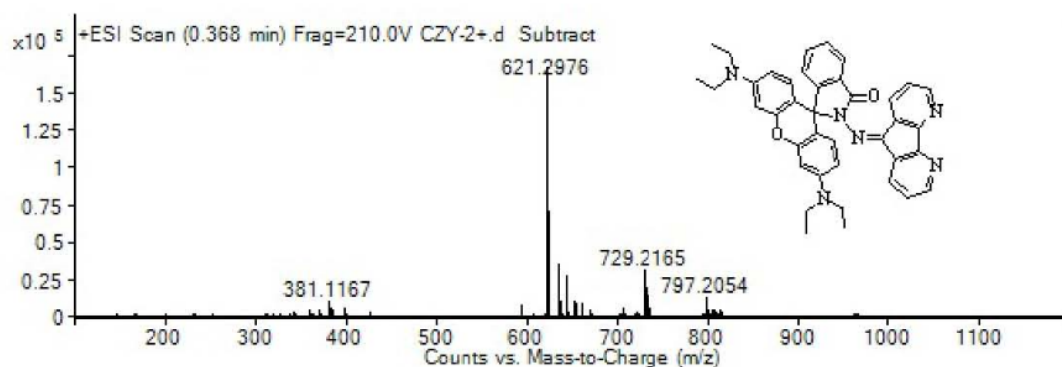**Authors:** Zeyu Chen, Guoyun Meng, Huaijun Tang,* Yanchun Ye, Riyong Sun, Mingxian Chen and Kai-Min Wang*
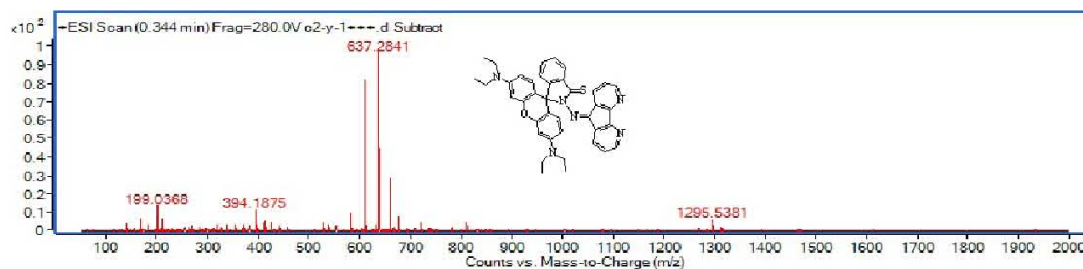
Fig. S1 Mass spectrum of RB-DAF
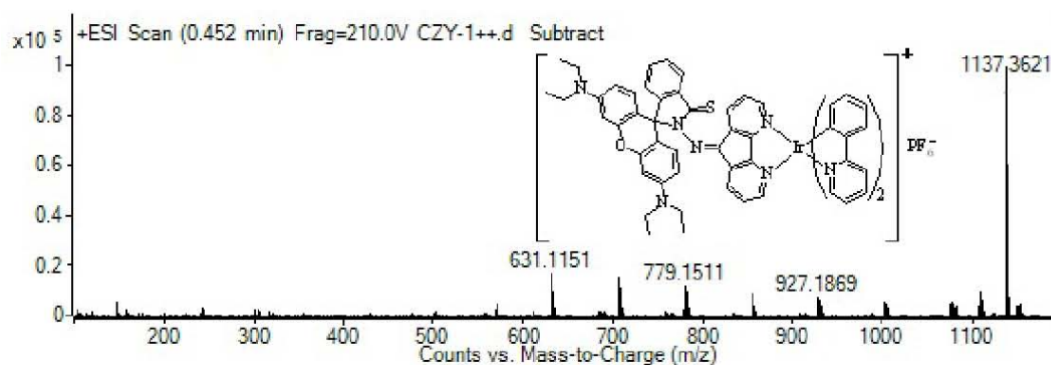

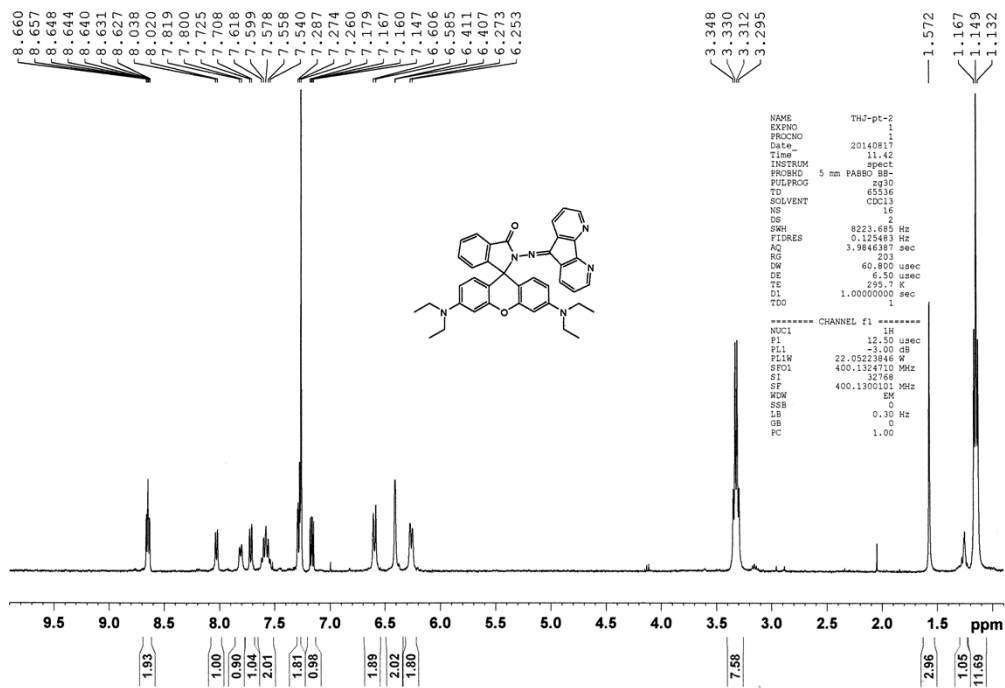Fig. S2 Mass spectrum of SRB-DAF

Fig. S3 Mass spectrum of [(SRB-DAF)Ir(ppy)$_2$]PF$_6$

Fig. S4 ^{1}H NMR spectrum of RB-DAF
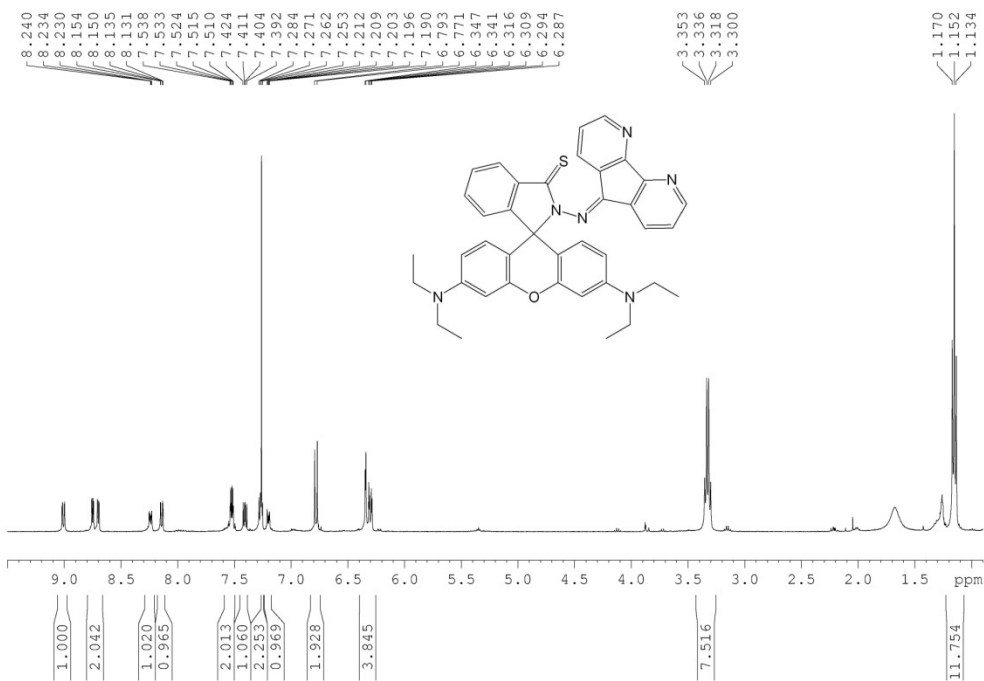

Fig. S5 ^{1}H NMR spectrum of SRB-DAF
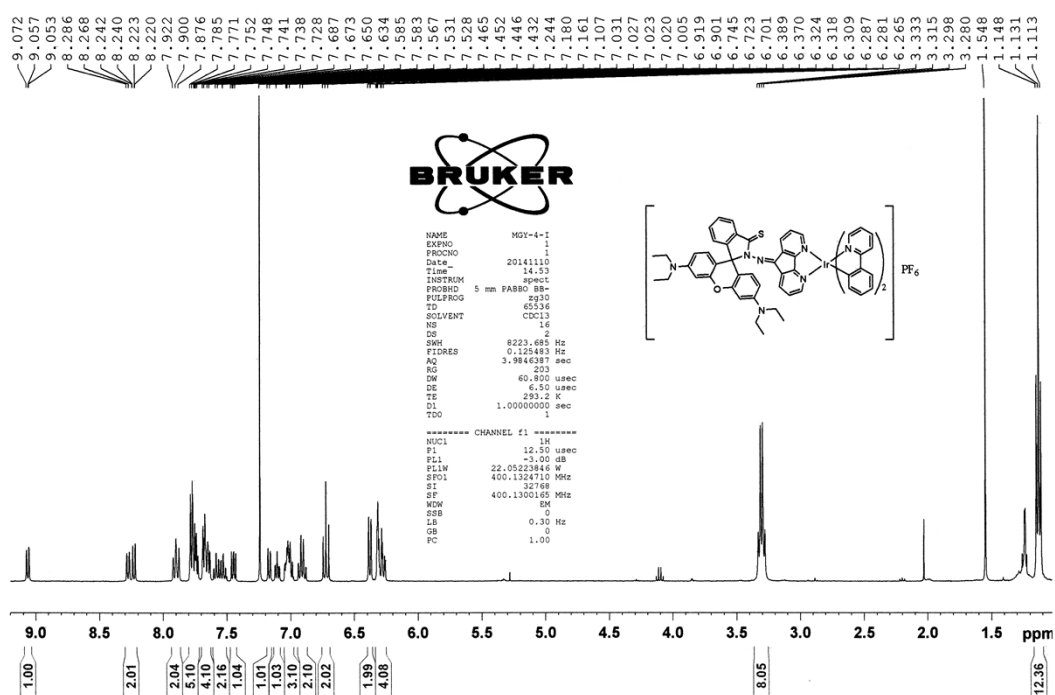
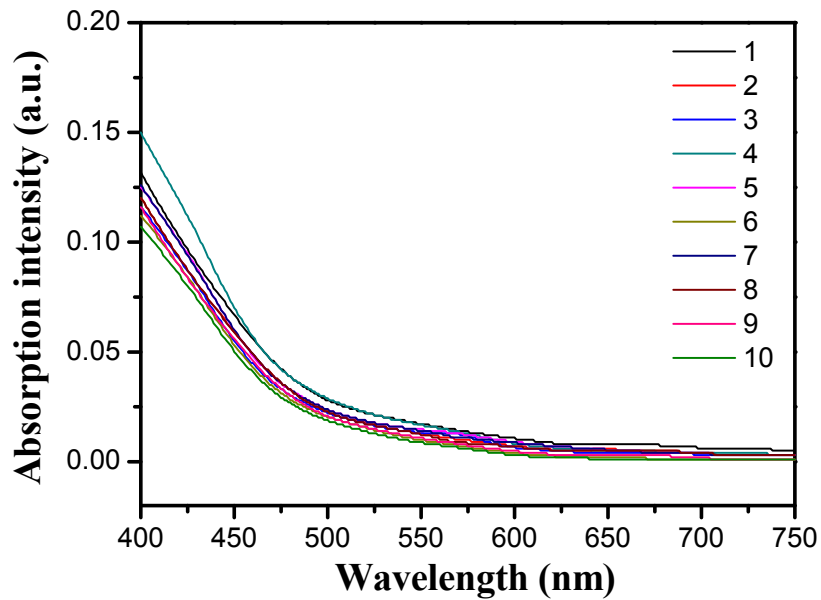Fig. S6 ^{1}H NMR spectrum of [(SRB-DAF)Ir(ppy)$_2$]PF$_6$

Fig. S7 The absorption spectra of 10 times blank measurements

Table S1 Absorption intensity at 567 nm, deviations, deviation squares and standard
deviation of 10 times blank absorption measurements

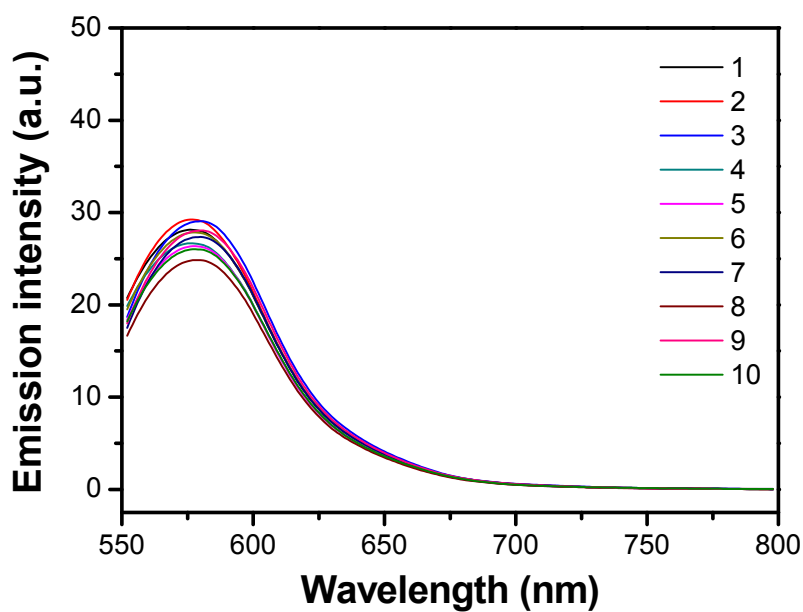| Sequence numbers	Absorption intensity at 567 nm	Deviations	Deviation squares	Standard deviation
1	0.015	0.004	1.6×10^{-5}	0.00271
2	0.011	0	0	
3	0.013	0.002	4.0×10^{-6}	
4	0.014	0.003	9.0×10^{-6}	
5	0.013	0.002	4.0×10^{-6}	
6	0.008	-0.003	9.0×10^{-6}	
7	0.011	0	0	
8	0.009	-0.002	4.0×10^{-6}	
9	0.009	-0.002	4.0×10^{-6}	
10	0.007	-0.004	1.6×10^{-5}	

Fig. S8 The emission spectra of 10 times blank measurements

Table S2 Emission intensity at 587 nm, deviations, deviation squares and standard deviation of

10 times blank emission measurements

Sequence numbers	Emission intensity at 587 nm	Deviations	Deviation squares	Standard deviation
1	26.6409	0.4044	0.16354	1.3143
2	27.57328	1.33678	1.78698	
3	28.20423	1.96773	3.87195	
4	25.34816	-0.88834	0.78915	
5	25.24046	-0.99604	0.9921	
6	26.64498	0.40848	0.16685	
7	26.48222	0.24572	0.06038	
8	23.95531	-2.28119	5.20384	
9	27.25406	1.01756	1.03542	
10	25.02142	-1.21508	1.47642	