

Supporting Information

A Novel Dual-switch Fluorescent Probe for Cr(III) Ion Based on PET-FRET Processes

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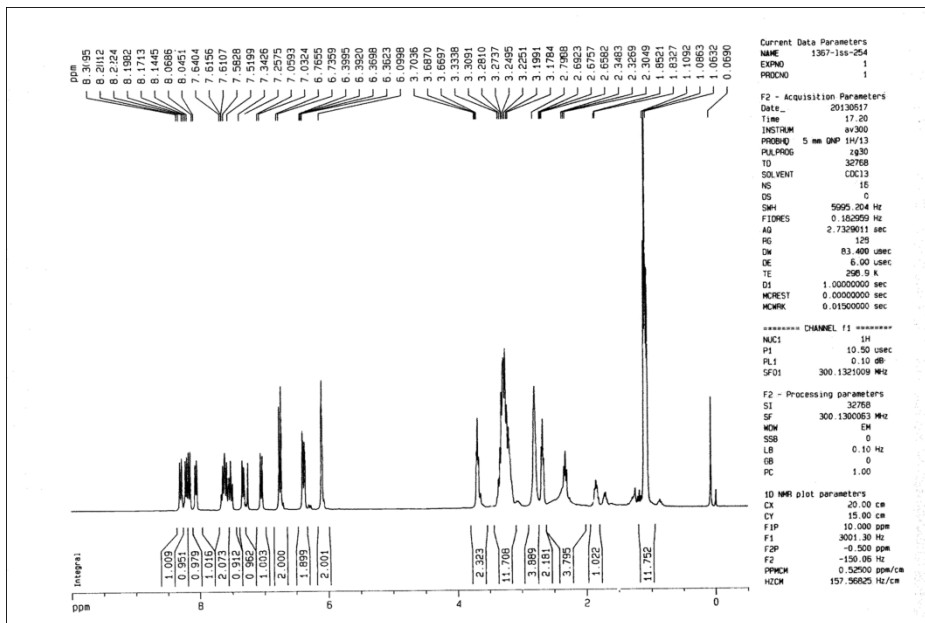


Figure S-1. ¹H NMR spectrum of NNRhB.

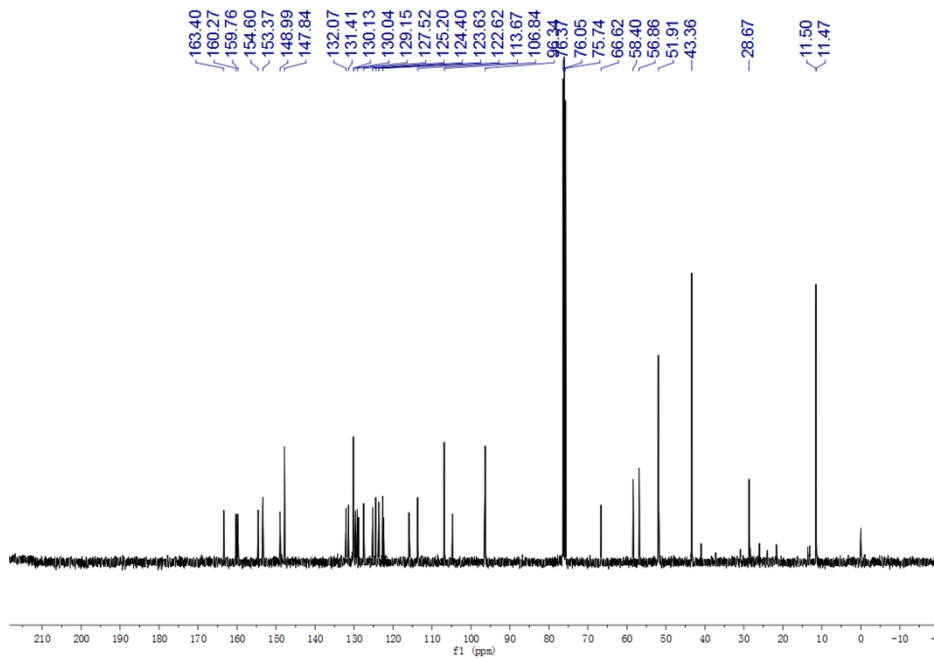


Figure S-2. ¹³C NMR spectrum of NNRhB.

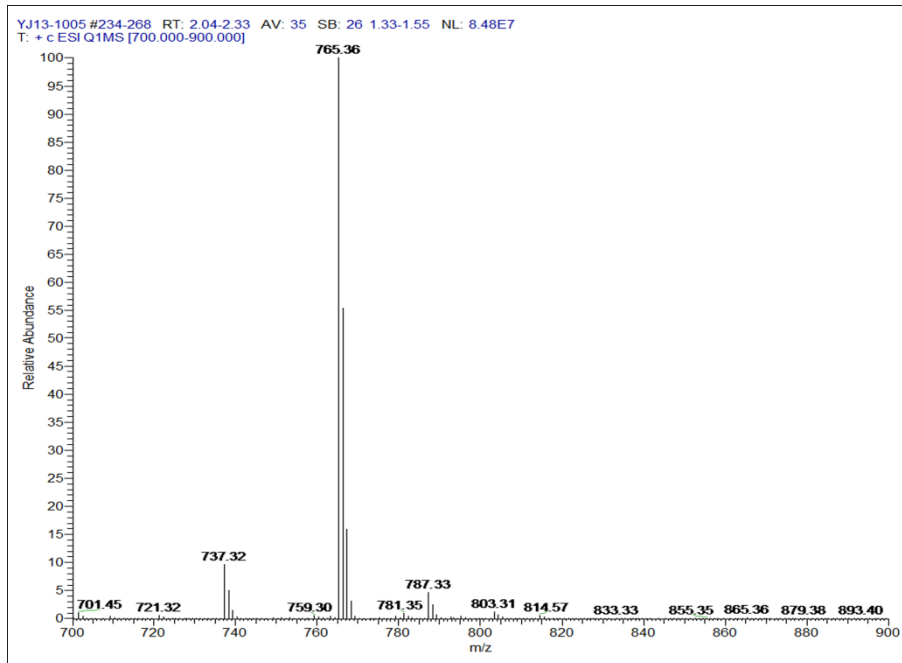


Figure S-3. ESI-MS spectrum of NNRhB.

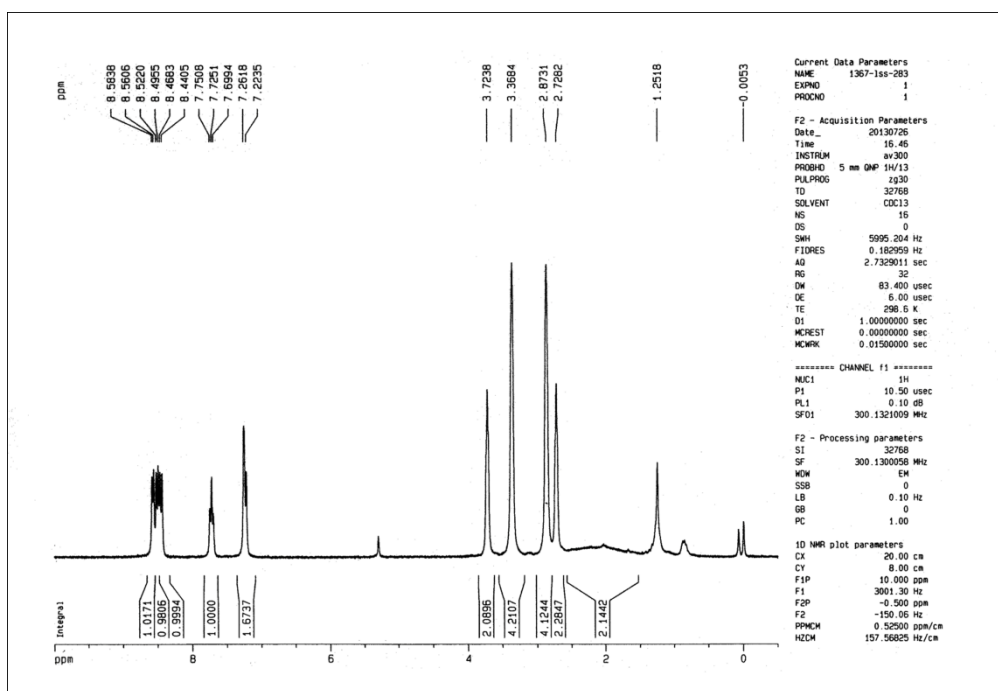


Figure S-4. ¹H NMR spectrum of compound 1.

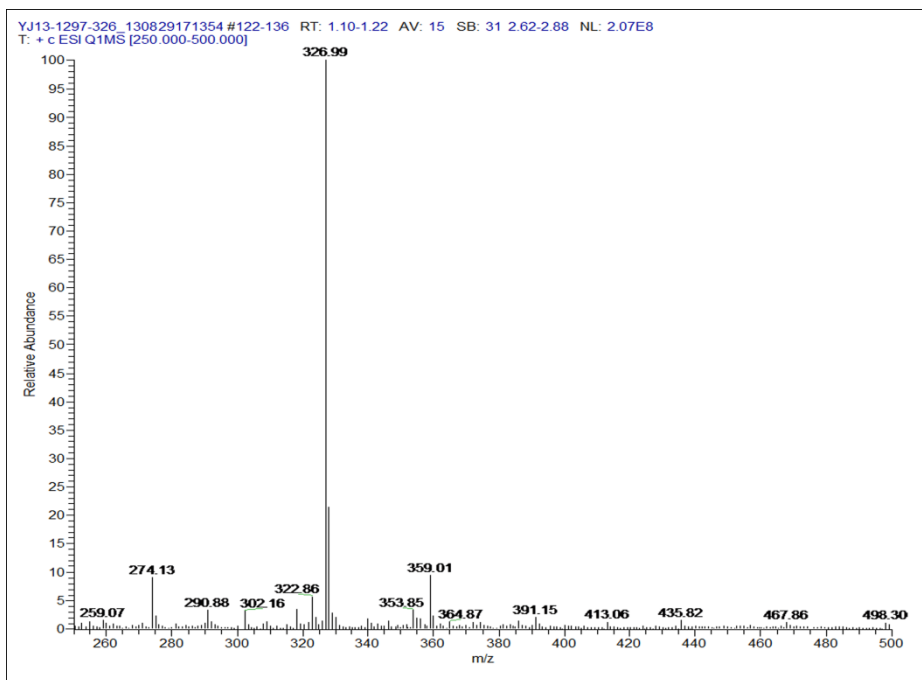


Figure S-5. ESI-MS spectrum of compound 1.

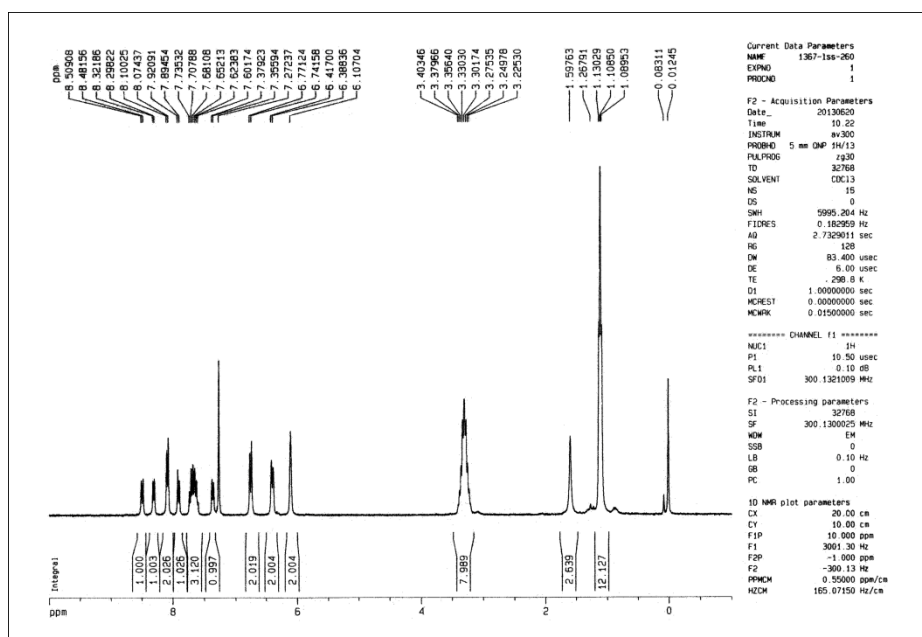


Figure S-6. ¹H NMR spectrum of compound 2.

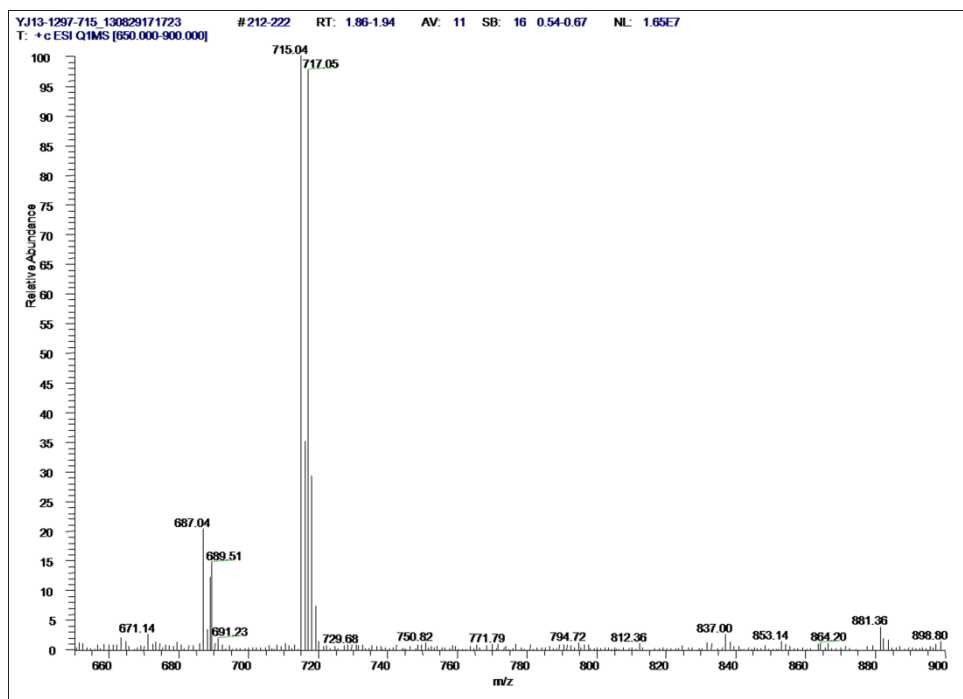


Figure S-7. ESI-MS spectrum of compound 2.

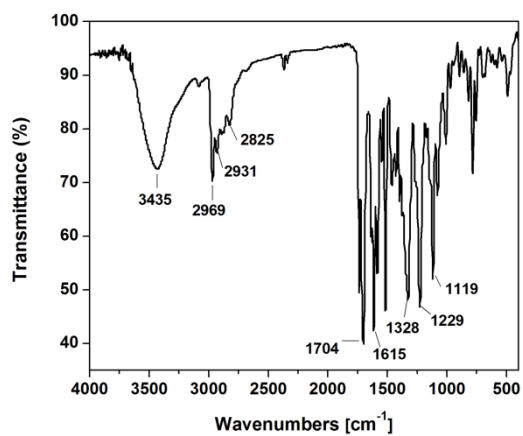


Figure S-8. FT-IR spectra of NNRhB.

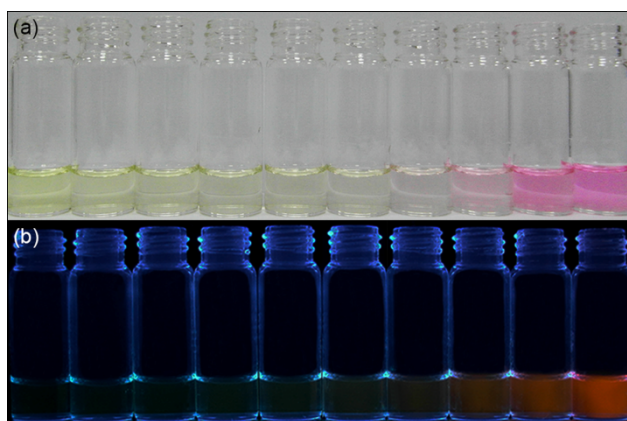


Figure S-9. Photographs of color changes (a) and fluorescence responses (b) of NNRhB coordinated with different concentration of Cr^{3+} ions (from left to right: 0, 5, 10, 20, 30, 40, 50, 60, 70 and 80 μM).

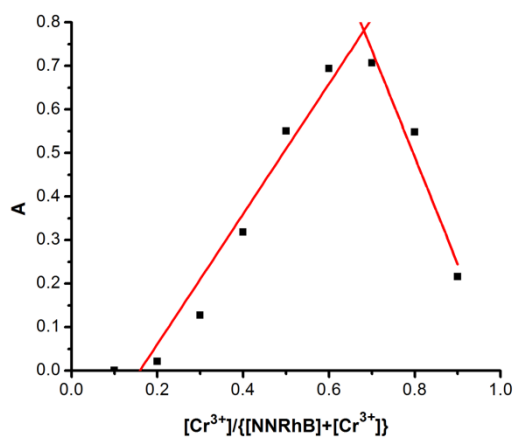


Figure S-10. Job's plot showing the 1:2 binding of NNRhB with Cr^{3+} ion.

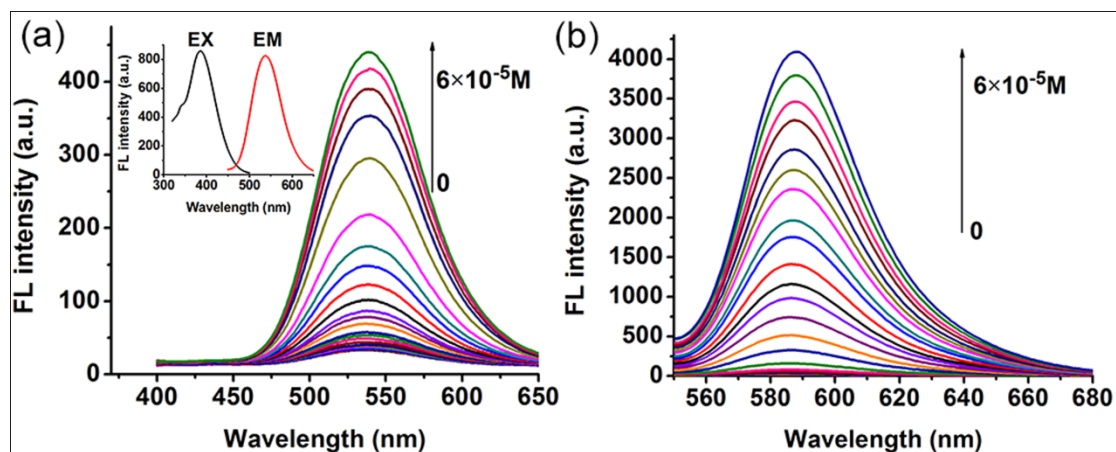


Figure S-11. (a) Fluorescence spectra of compound **1** (13 μM) upon addition of increasing Cr³⁺ concentrations in CH₃CN/HEPES buffer solution (0-60 μM). (2:1, v/v, 0.5 mM, pH = 7.4) ($\lambda_{\text{ex}} = 386$ nm). (Inset: Excitation spectra and emission spectra of compound **1**.) (b) Fluorescence spectra of compound **2** (13 μM) upon addition of increasing Cr³⁺ concentrations in CH₃CN/HEPES buffer solution (0-60 μM). (2:1, v/v, 0.5 mM, pH = 7.4; $\lambda_{\text{ex}} = 530$ nm).

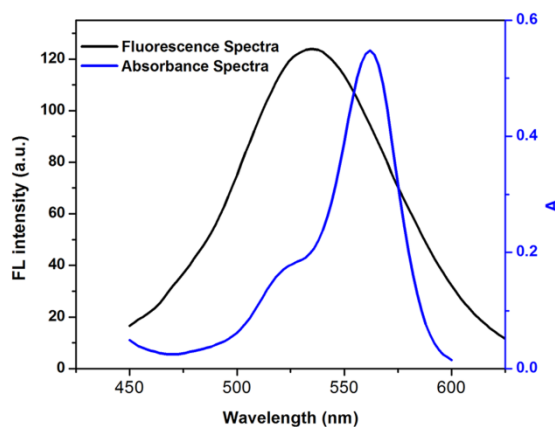


Figure S-12. The spectral overlap between the absorption of Cr³⁺-compound **2** and the fluorescence emission of Cr³⁺-compound **1**.

Reagent	Selectivity	Detection range (μM)	Detection limit (nM)	Ref.
Rhodamine B derivative	Cr^{3+}	-	1000	1
Rhodamine B derivative	Hg^{2+} ; Cr^{3+}	-	0.14	2
Quercetin	Cr	0.1-2	9.1	3
Rhodamine derivative	Cr^{3+}	0.1-8	3.75	4
Rhodamine 6G derivative	Fe^{3+} ; Cr^{3+}	-	-	5
Acridone derivative	Cr^{3+}	1-18	200	6
Rhodamine B derivative	Cr^{3+}	0.03-80	0.14	Our work

Table S-1. Comparison of our probe with other fluorescent organic molecules for the detection of Cr^{3+} .

Sample	Added (μM)	found (μM)	Recovery(%)	RSD(%)
	0	0		
	10	10.36	103.6	
Pond water	10	10.31	103.1	0.436
	10	10.43	104.3	
	0	0		
	10	9.63	96.3	
Tap water	10	9.59	95.9	0.267
	10	9.65	96.5	

Table S-2. Recovery study of spiked Cr^{3+} in pond water and tap water with proposed sensing system.

Sample	Added (μM)	Found (μM)	Recovery(%)	RSD(%)
	0	0		
	10	10.08	100.8	
Cell lysate	10	10.05	100.5	0.168
	10	10.05	100.5	
	0	0		
	10	10.05	100.5	
blood serum	10	10.13	101.3	0.424
	10	10.06	100.6	

Table S-3. Recovery study of spiked Cr^{3+} in cell lysate and blood serum with proposed sensing system.

REFERENCES

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