Electronic Supplementary Material (ESI) for RSC Advances.

Supplementary information

Cascade OFF-ON-OFF Fluorescent Probe: Dual Detection of Trivalent Ions and Phosphate Ions †

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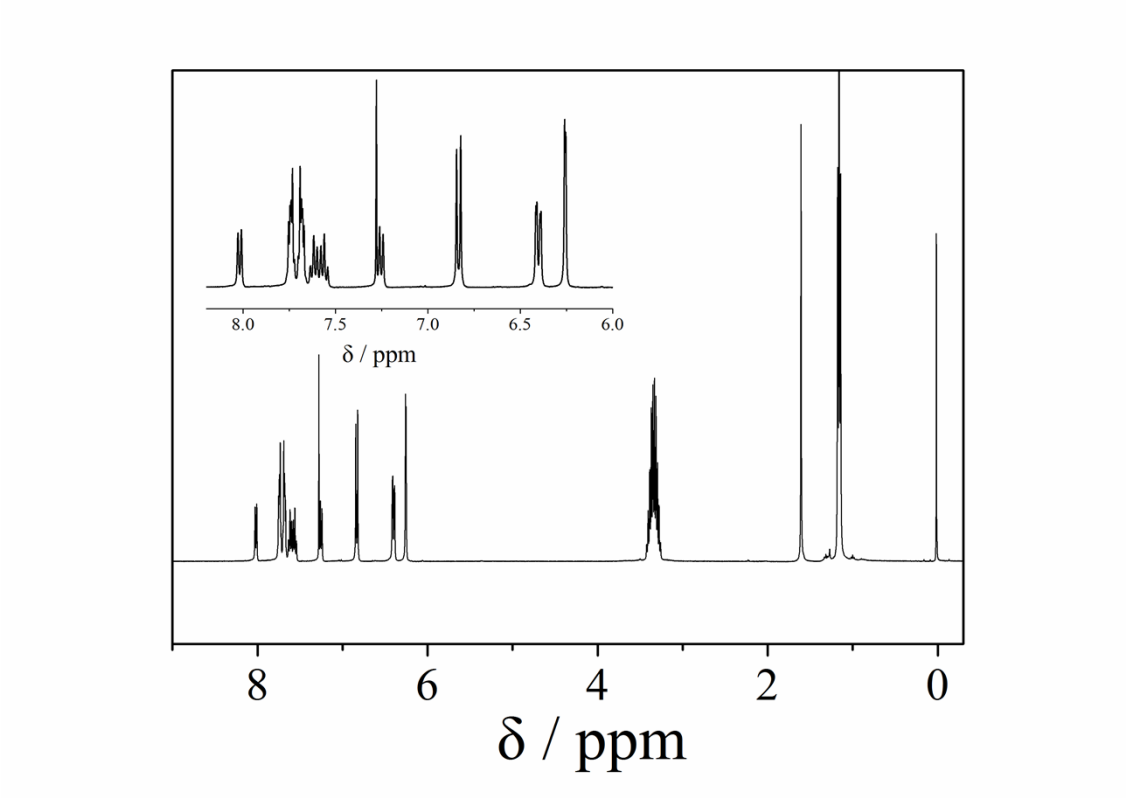

Figure S1. ^{1}H NMR spectrum of probe L.

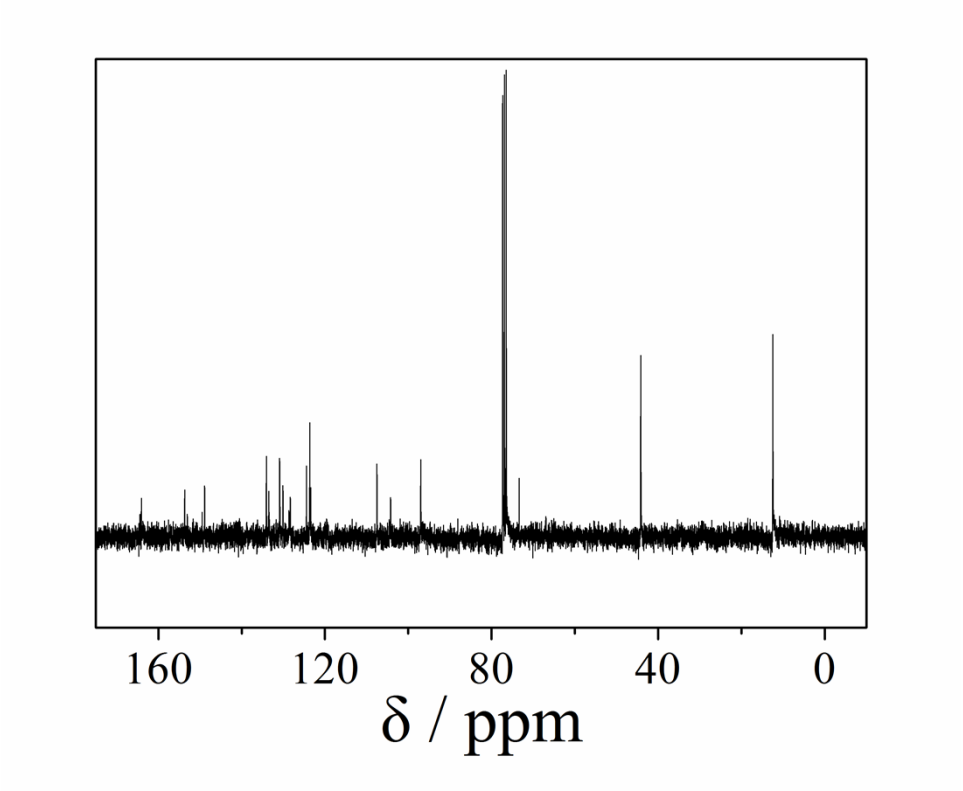

Figure S2. ^{13}C NMR spectrum of probe L.

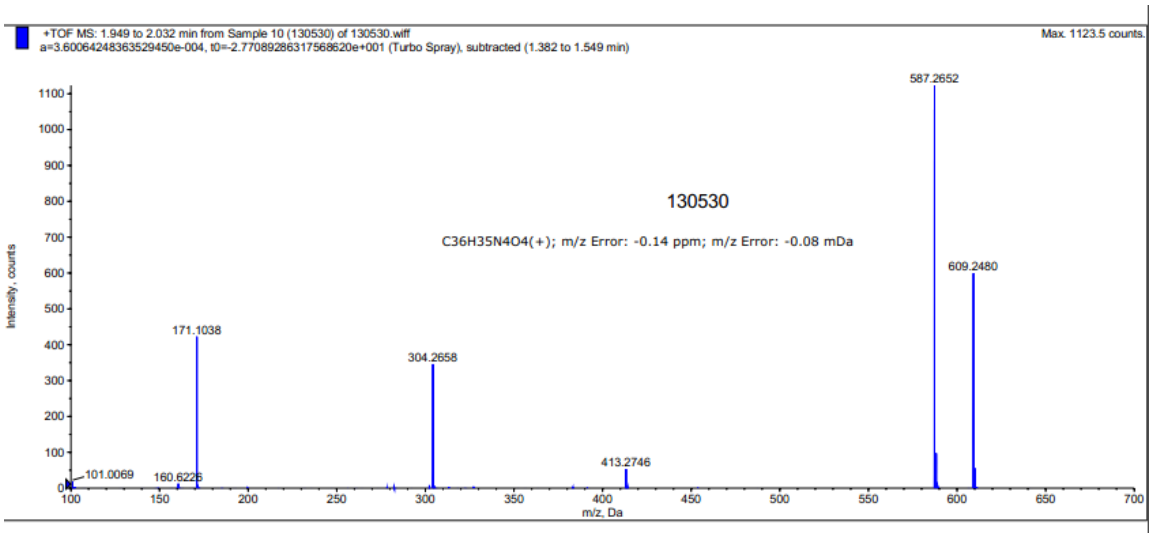

Figure S3. High-resolution mass spectrum of probe L.

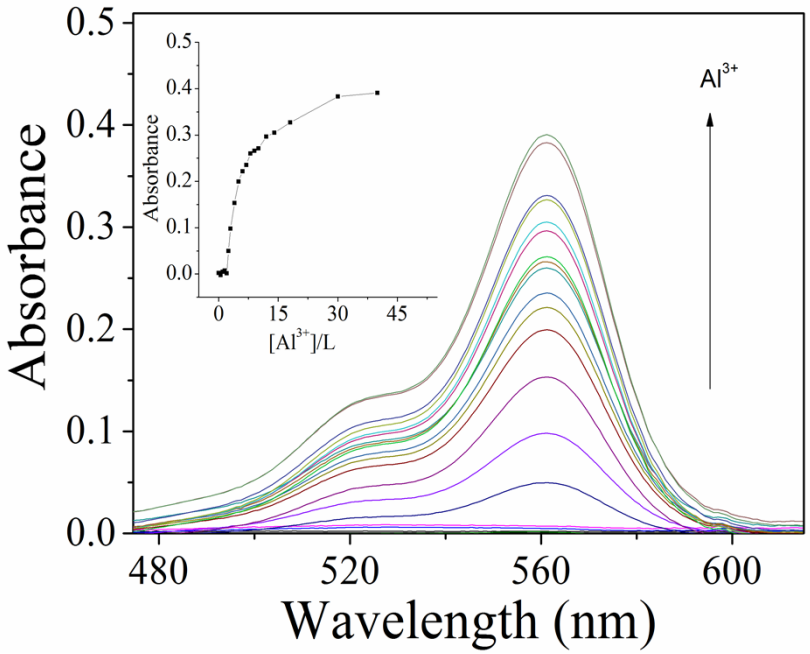

Figure S4. UV-vis absorption spectra obtained for probe L (25 μM) in CH_3CN/Tris-buffer (1/1, v/v, pH = 7.0) with various amounts of Al^{3+} ion. Inset: Absorbance at 564 nm of L as a function of $[Al^{3+}]$.

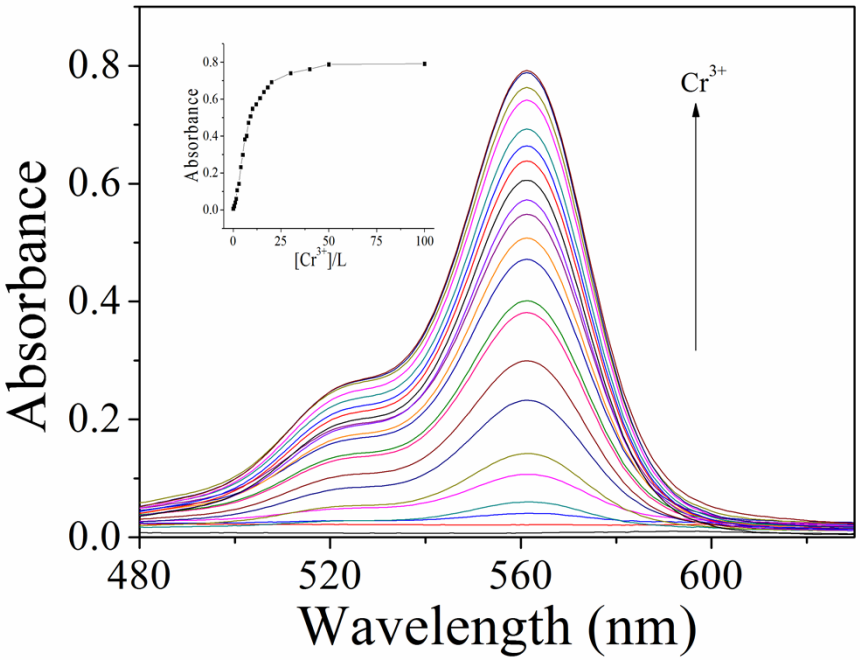

Figure S5. UV-vis absorption spectra obtained for probe L (25 μM) in CH_3CN/Tris-buffer (1/1, v/v, pH = 7.0) with various amounts of Cr^{3+} ion. Inset: Absorbance at 564 nm of L as a function of $[Cr^{3+}]$.

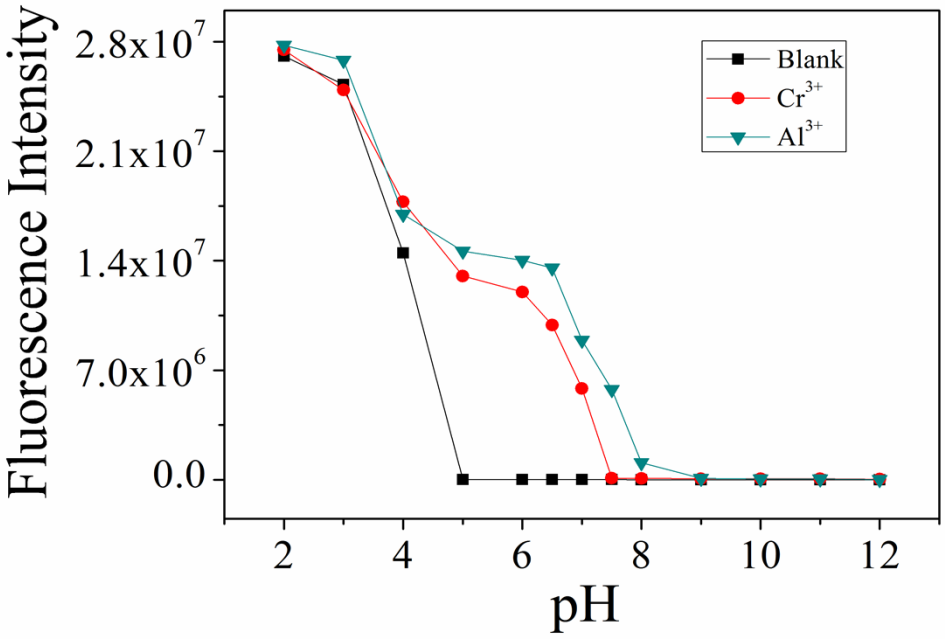

Figure S6. Fluorescence spectra of L (10 μM) in the absence and presence of Al^{3+} or Cr^{3+} ion (80 μM each) in CH_3CN/H_2O (1/1, v/v, pH = 7.0) at various pH values, λ_{ex}= 520 nm.

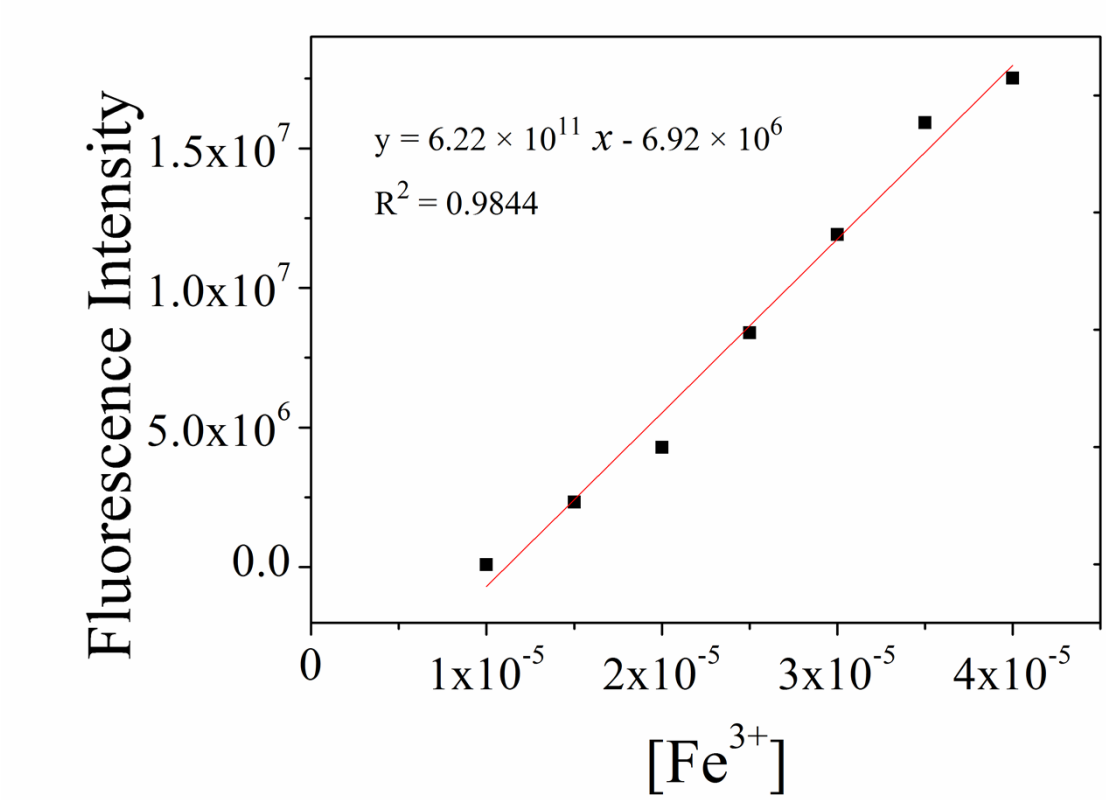

Figure S7. Linear response of fluorescence intensity at 586 nm of L (10 μM) to the Fe^{3+} concentrations changes in CH_3CN/Tris-buffer (1/1, v/v, pH = 7.0). The unit of *x* is mol/L.

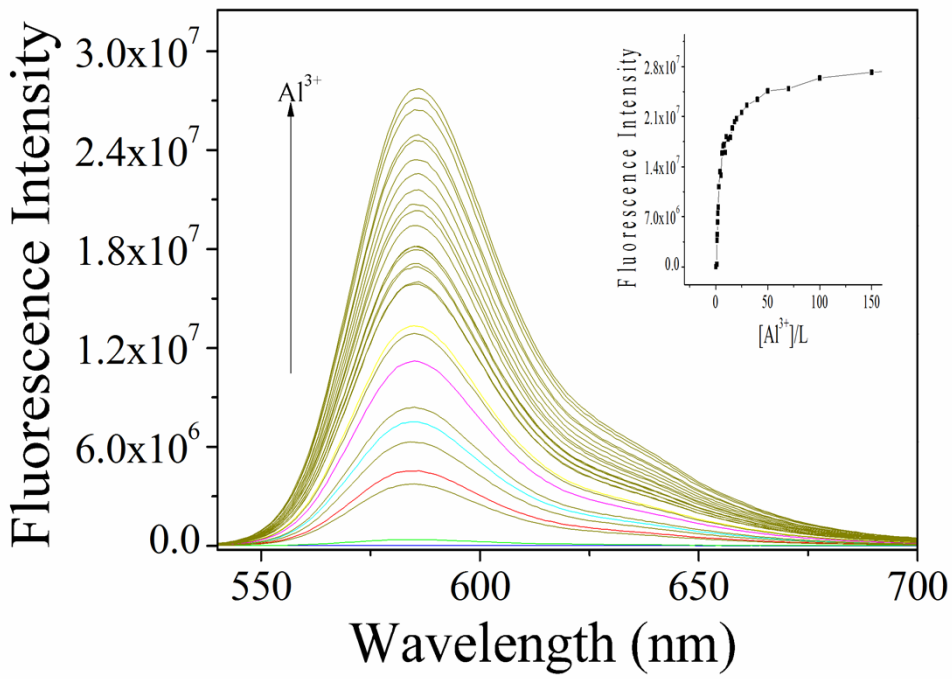

Figure S8. Fluorescence titrations of L (10 μM) with Al^{3+} ion in CH_3CN/Tris-buffer (1/1, v/v, pH = 7.0). Inset: Change of fluorescence emission intensity with the increasing amount of Al^{3+} at 586 nm, λ_{ex}= 520 nm.

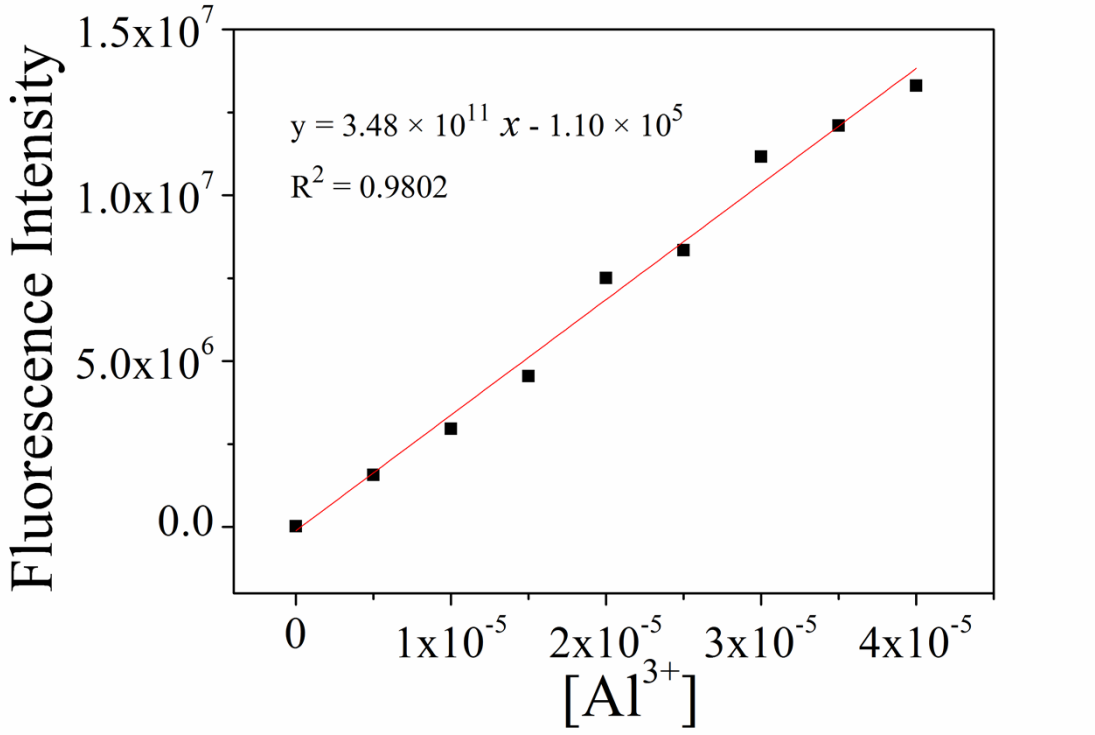

Figure S9. Linear response of fluorescence intensity for L (10 μM) at 586 nm to the Al^{3+} concentration changes in CH_3CN/Tris-buffer (1/1, v/v, pH = 7.0). The unit of *x* is mol/L.

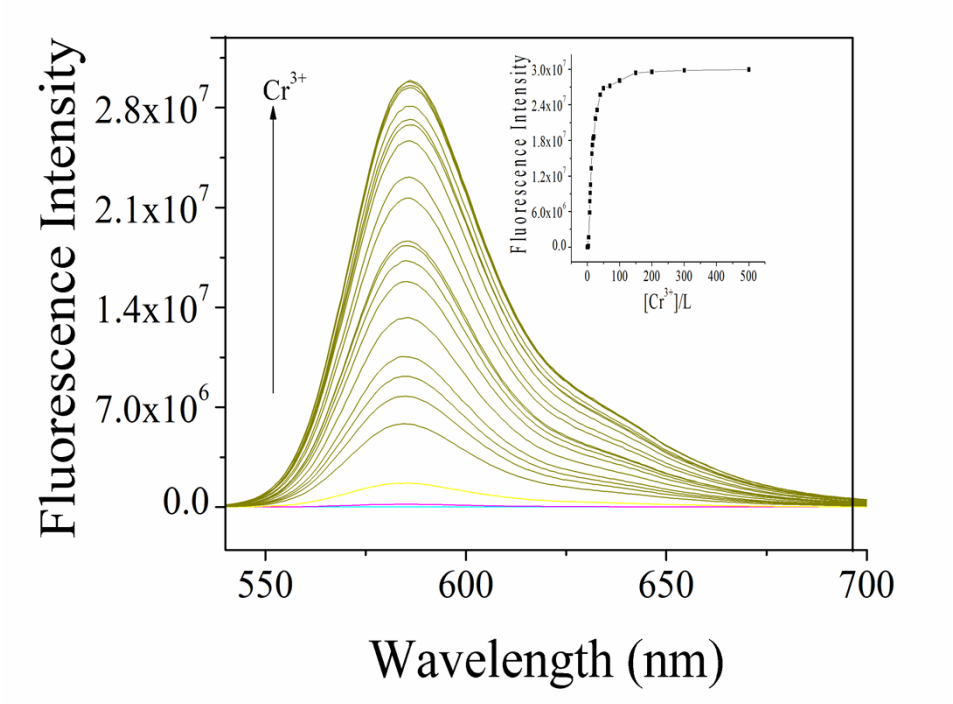

Figure S10. Fluorescence titrations of L (10 μM) with Cr^{3+} ion in CH_3CN/Tris-buffer (1/1, v/v, pH = 7.0). Inset: Change of fluorescence emission intensity with the increasing amount of Cr^{3+} at 586 nm, λ_{ex}= 520 nm.

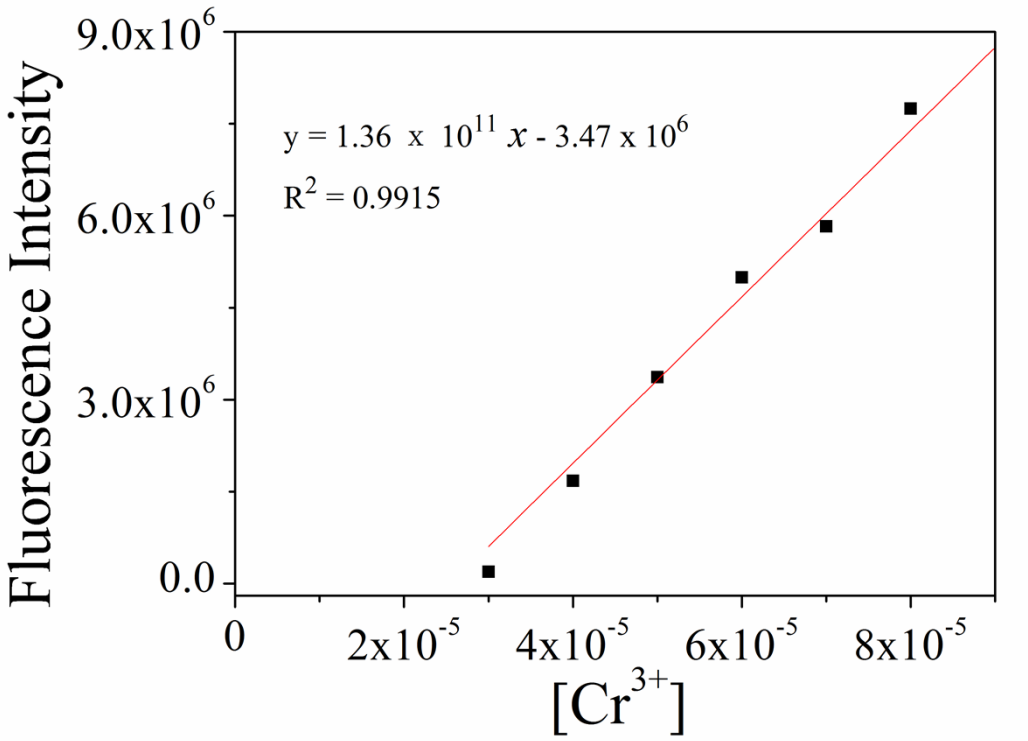

Figure S11. Linear response of fluorescence intensity for L (10 μM) at 586 nm to the Cr^{3+} concentration changes in CH_3CN/Tris-buffer (1/1, v/v, pH = 7.0). The unit of *x* is mol / L.

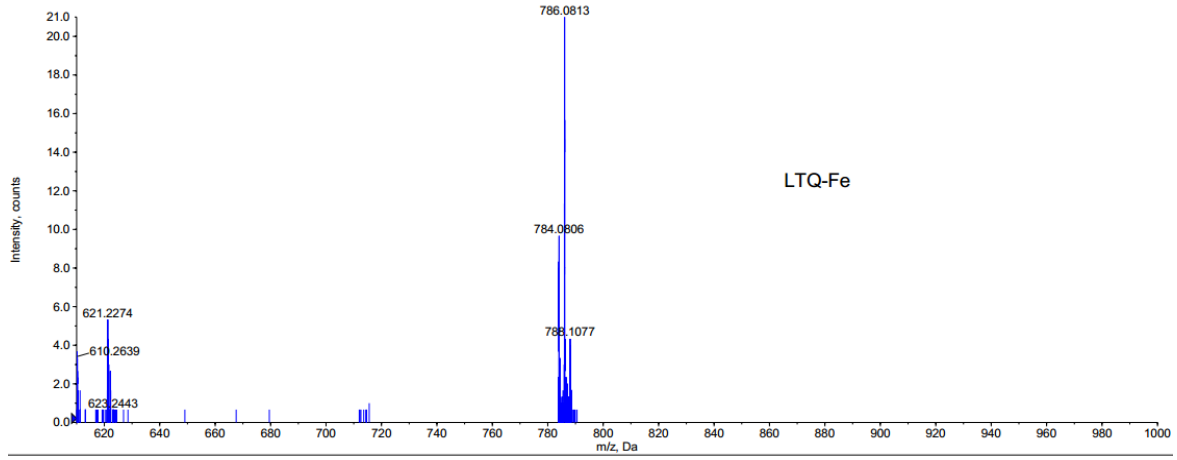

Figure S12. High-resolution mass spectrum of L-Fe^{3+} complex.

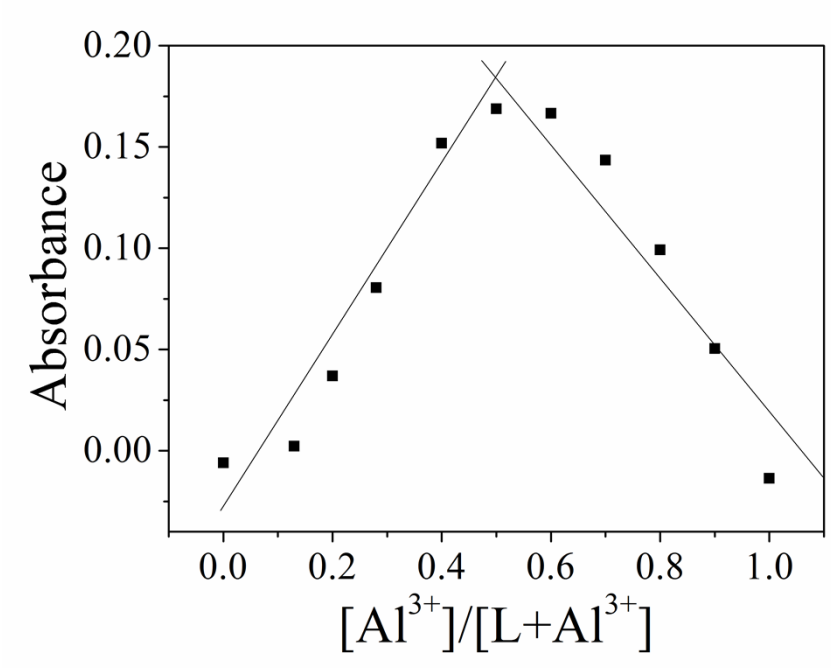

Figure S13. Job's plot for the determination of binding stoichiometry between L and Al^{3+} ion in CH_3CN/Tris-buffer (1/1, v/v, pH = 7.0).

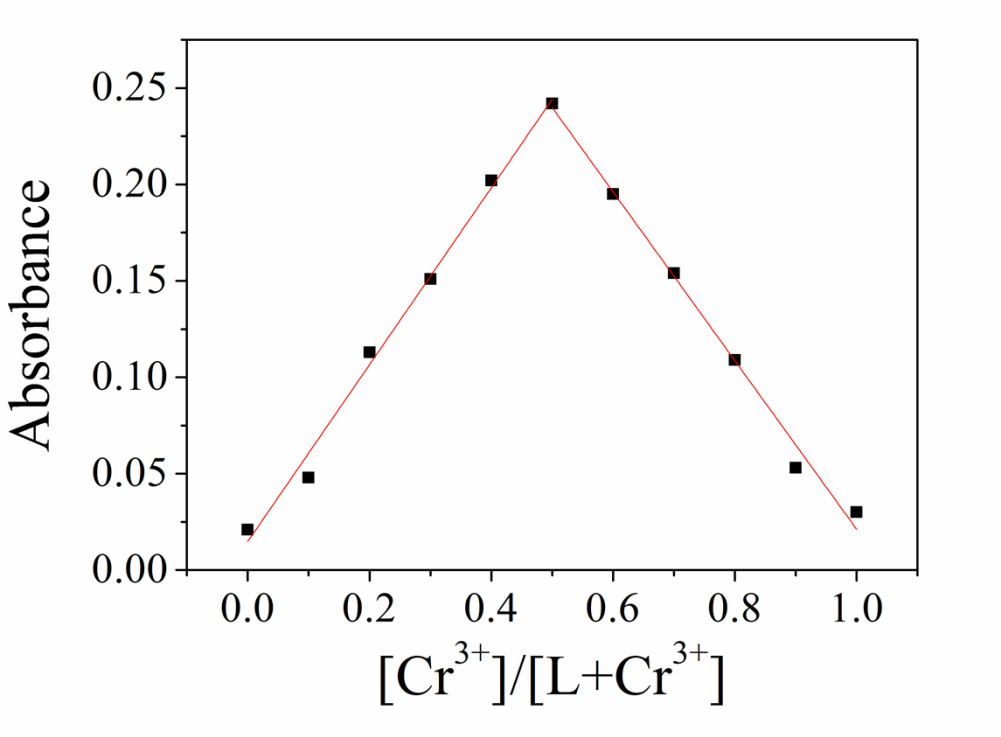

Figure S14. Job's plot for the determination of binding stoichiometry between L and Cr^{3+} ion in CH_3CN/Tris-buffer (1/1, v/v, pH = 7.0).

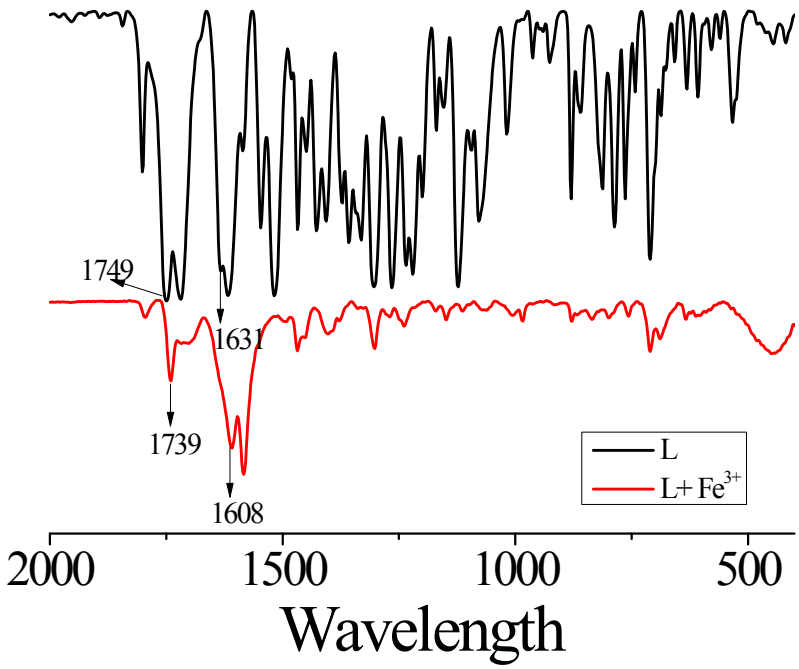

Figure S15. FT-IR spectra of probe L and L-Fe^{3+} complex

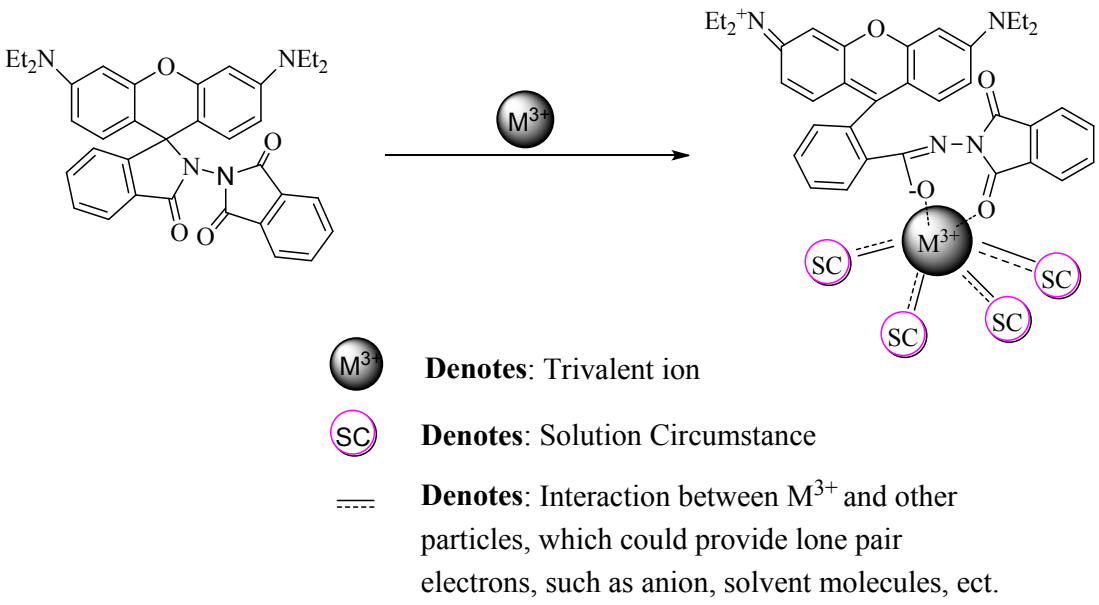

Figure S16. Proposed mechanism for the recognition of trivalent ion

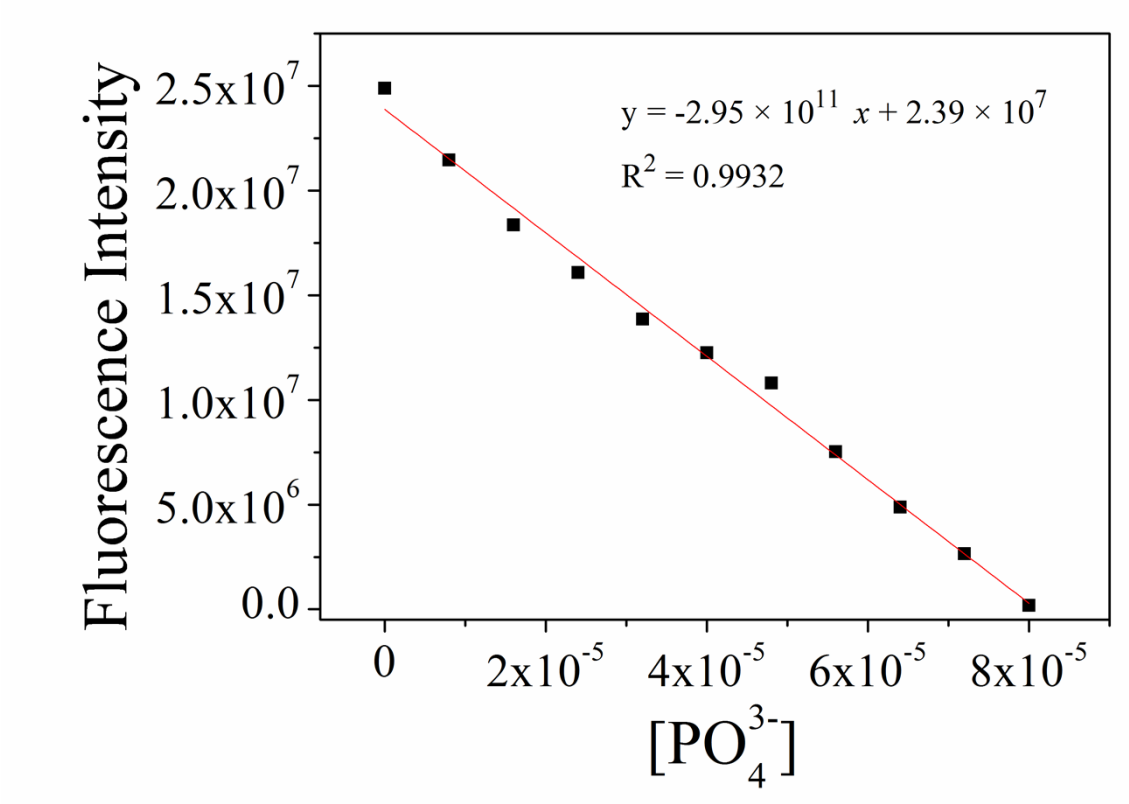

Figure S17. Linear response of fluorescence intensity at 586 nm of the L-Fe^{3+} complex to the PO_4^{3-} concentration changes in CH_3CN/Tris-buffer (1/1, v/v, pH = 7.0), [L] = 10 μM, [Fe^{3+}] = 80 μM. The unit of *x* is mol/L.

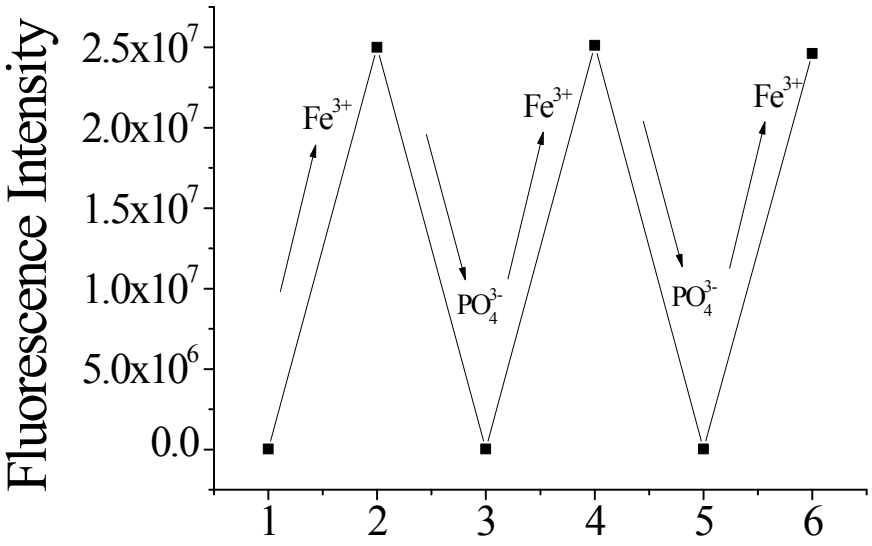

Figure S18. Cascade fluorescence OFF-ON-OFF response of probe L with alternate addition of Fe^{3+} cation and PO_4^{3-} anion.

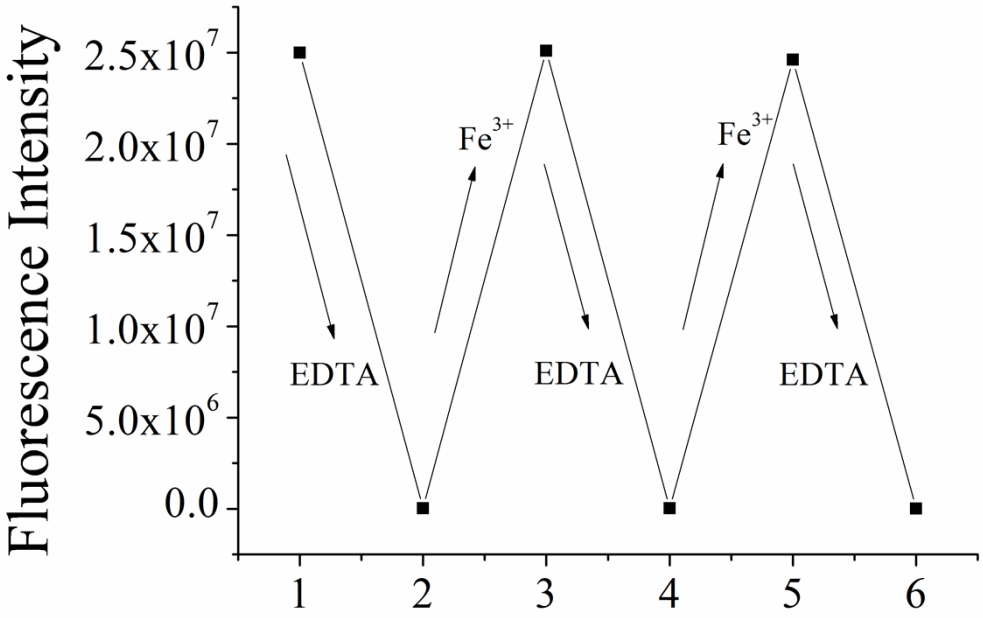

Figure S19. Reversibility of the Fe^{3+} sensing process against the addition of chelating agent EDTA.