Electronic Supplementary Material (ESI) for Polymer Chemistry

Synthesis of a Cyclen-Containing Disubstituted Polyacetylene with Strong Green Photoluminescence and its Application as Sensitive Chemosensor towards Sulfide Anion with Good Selectivity and High Sensitivity

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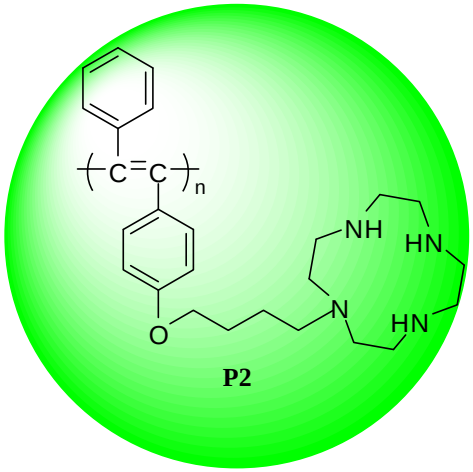
Chart S1



P2

Table 1 Elemental analysis of **P1** and **P2**.

Element	Content (%)	
	P1	**P2**
N	0	12.90
C	65.42	74.38
H	4.88	8.58

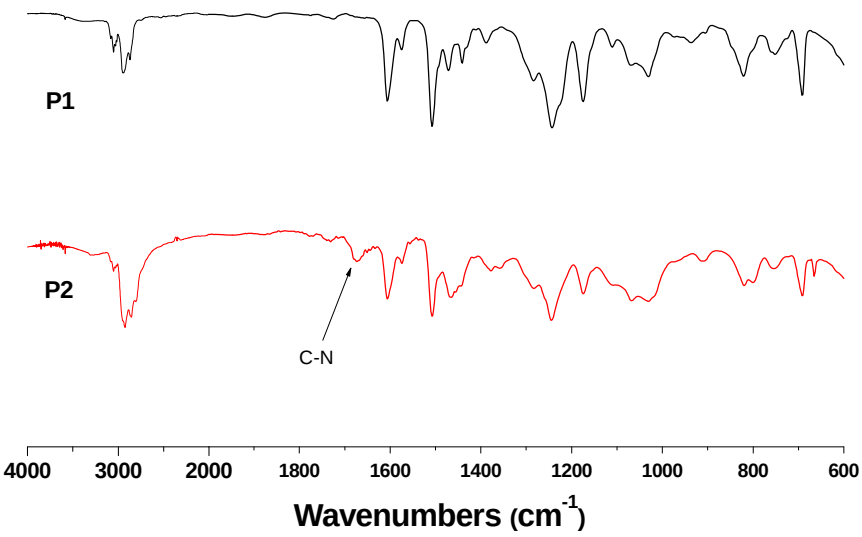


Figure S1a. IR spectra of polymers **P1** and **P2**.

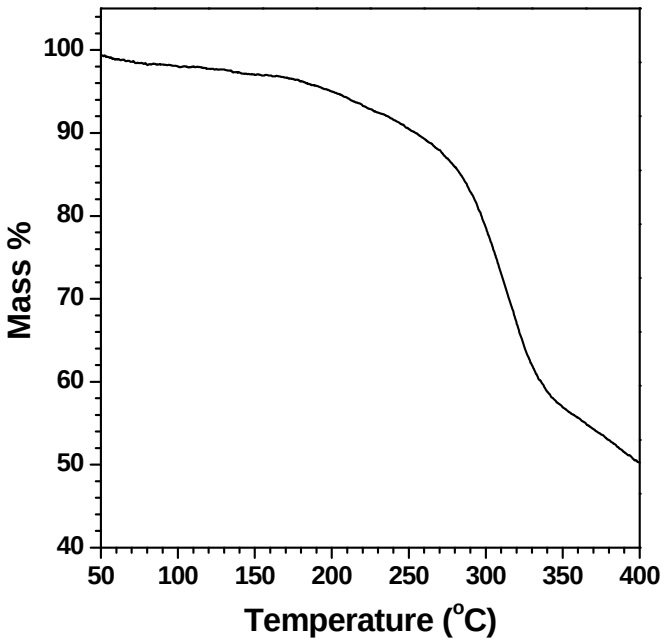


Figure S1b. TGA curves of **P2** at a heating rate of 10 °C/min under the atmosphere of N_2.

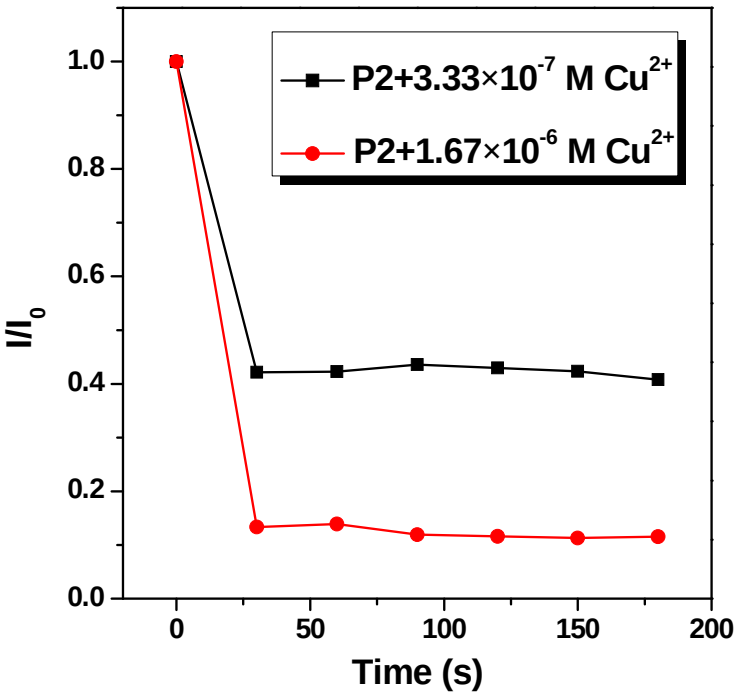


Figure S2a. Time course of the fluorescence response of **P2** (1.0×10^{-5} mol/L) in THF/H_2O (v/v=1:1) upon the addition of various concentration of Cu^{2+}. (λ_{Ex}=360 nm, slit: 10 nm/10 nm).

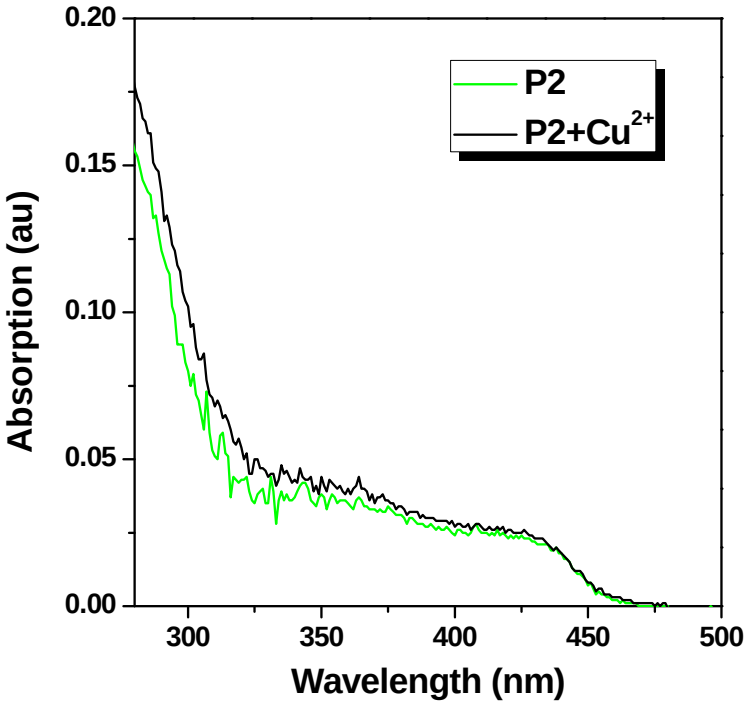


Figure S2b. The UV-vis absorption spectra of **P2** in THF/H_2O (v/v=1:1), before and after the addition of Cu^{2+} ions. The polymer concentration was 1.0×10^{-5} mol/L, The concentration of Cu^{2+} was 3.0×10^{-6} mol/L.

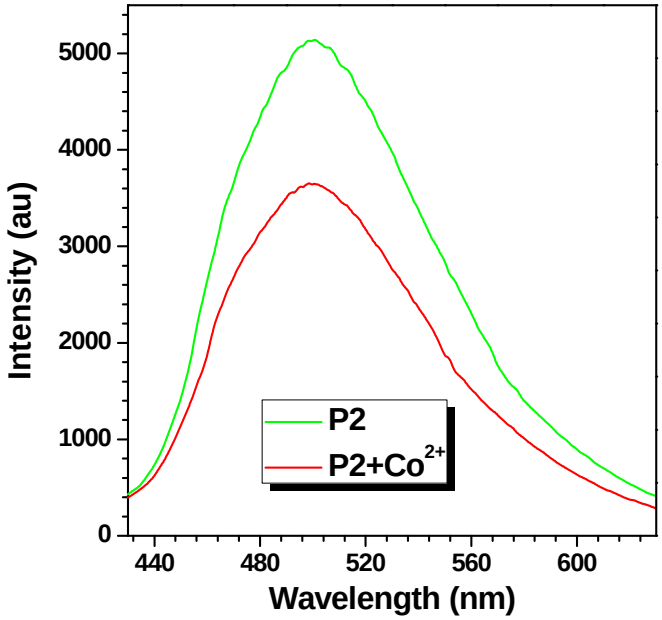


Figure S3. Fluorescence emission response profiles of **P2**. The polymer concentration was fixed at 1.0×10^{-5} mol/L and the concentration of the Co^{2+} ions was 3.0×10^{-5} mol/L. (λ_{Ex} =360 nm, slit: 10 nm/10 nm)

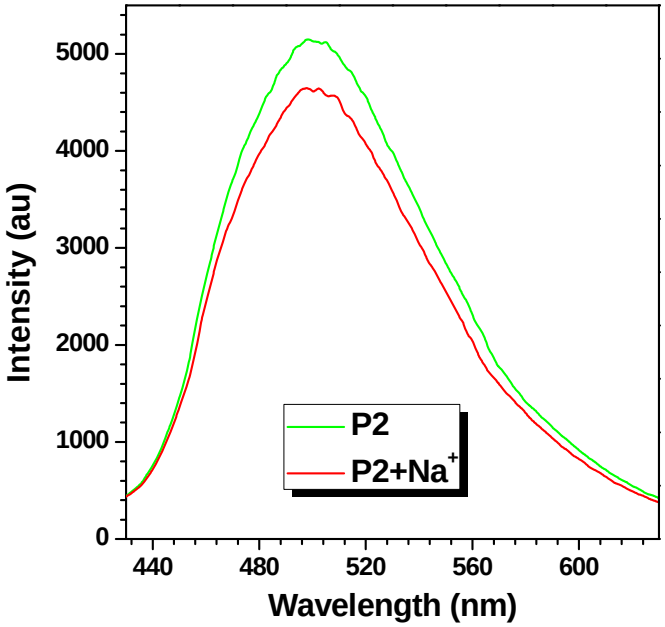


Figure S4. Fluorescence emission response profiles of **P2**. The polymer concentration was fixed at 1.0×10^{-5} mol/L and the concentration of the Na^{+} ions was 3.0×10^{-5} mol/L. (λ_{Ex} =360 nm, slit: 10 nm/10 nm)

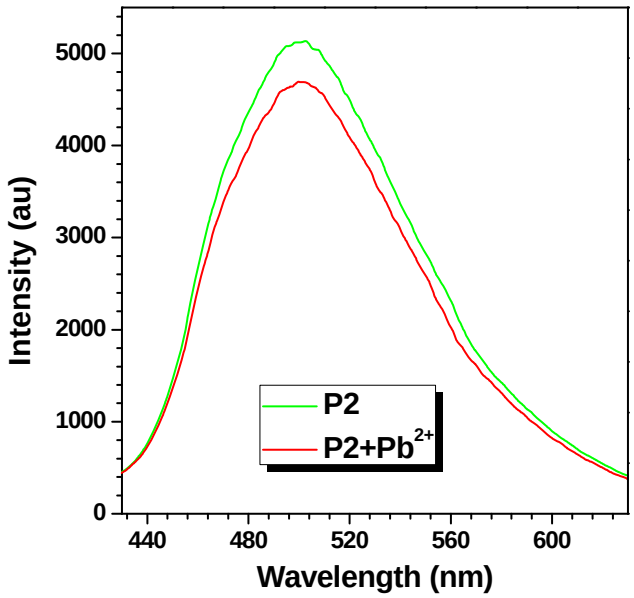


Figure S5. Fluorescence emission response profiles of **P2**. The polymer concentration was fixed at 1.0×10^{-5} mol/L and the concentration of the Pb^{2+} ions was 3.0×10^{-5} mol/L. (λ_{Ex} =360 nm, slit: 10 nm/10 nm)

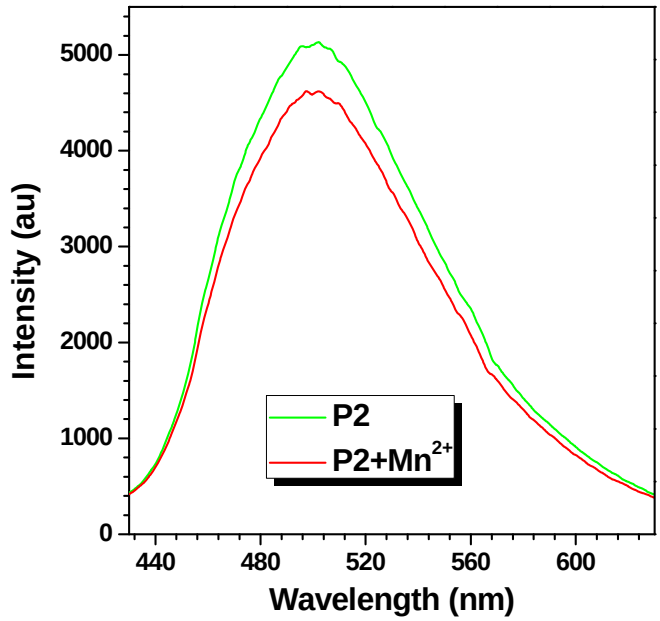


Figure S6. Fluorescence emission response profiles of **P2**. The polymer concentration was fixed at 1.0×10^{-5} mol/L and the concentration of the Mn^{2+} ions was 3.0×10^{-5} mol/L. (λ_{Ex} =360 nm, slit: 10 nm/10 nm)

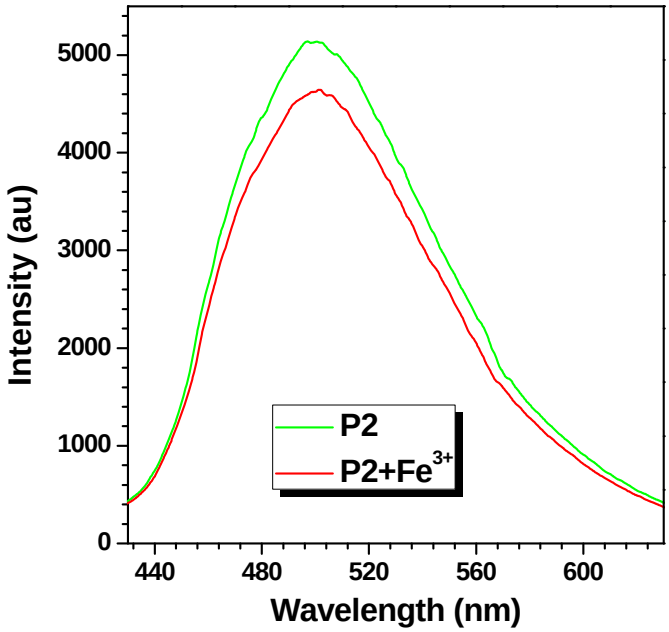


Figure S7. Fluorescence emission response profiles of **P2**. The polymer concentration was fixed at 1.0×10^{-5} mol/L and the concentration of the Fe^{3+} ions was 3.0×10^{-5} mol/L. (λ_{Ex} =360 nm, slit: 10 nm/10 nm)

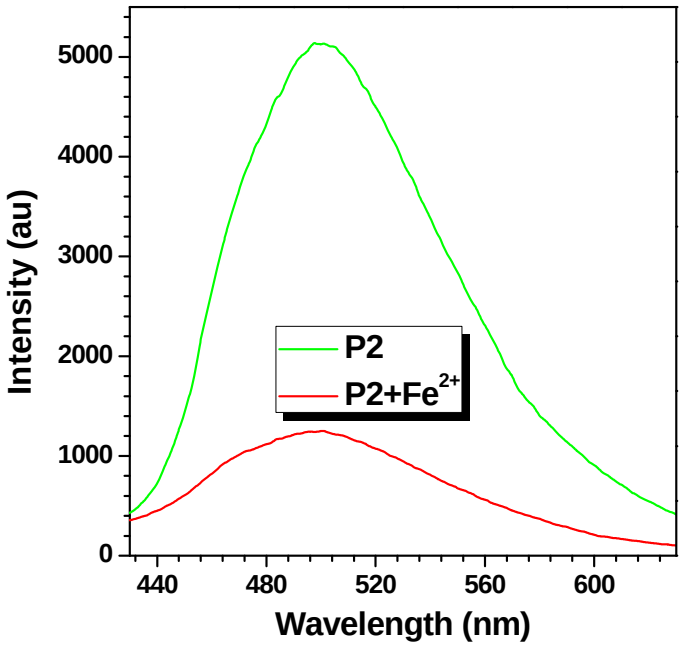


Figure S8. Fluorescence emission response profiles of **P2**. The polymer concentration was fixed at 1.0×10^{-5} mol/L and the concentration of the Fe^{2+} ions was 3.0×10^{-5} mol/L. (λ_{Ex} =360 nm, slit: 10 nm/10 nm)

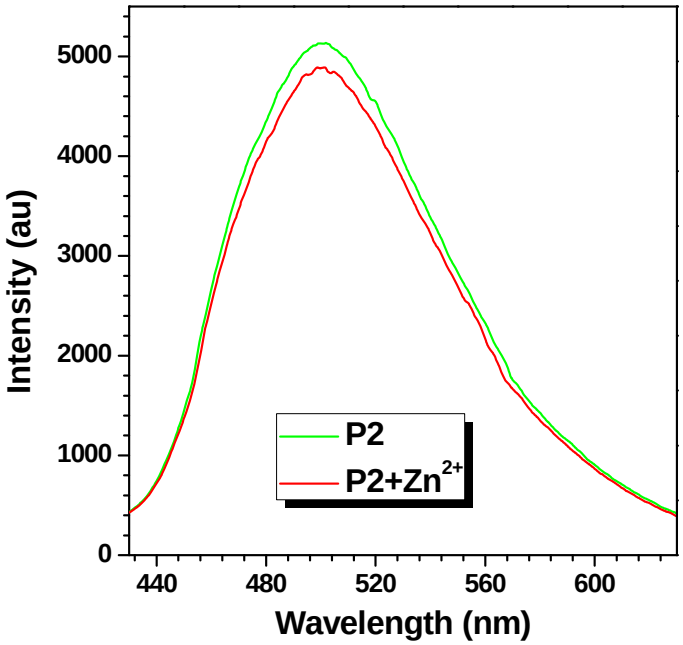


Figure S9. Fluorescence emission response profiles of **P2**. The polymer concentration was fixed at 1.0×10^{-5} mol/L and the concentration of the Zn^{2+} ions was 3.0×10^{-5} mol/L. (λ_{Ex} =360 nm, slit: 10 nm/10 nm)

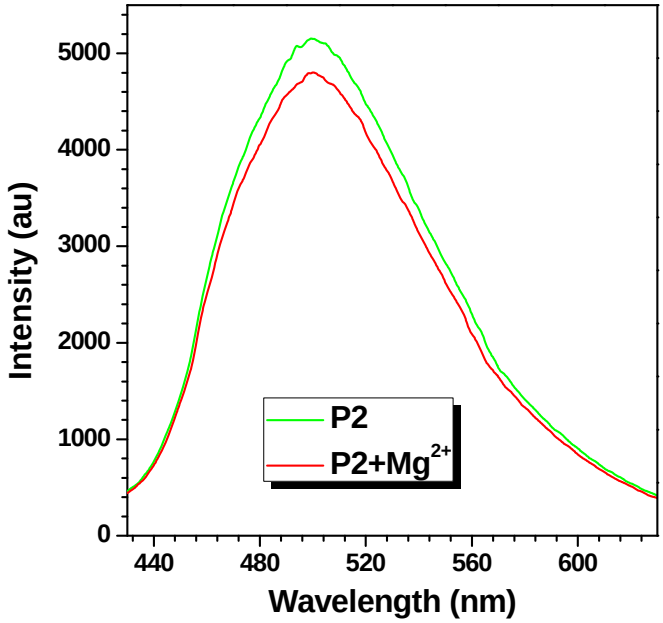


Figure S10. Fluorescence emission response profiles of **P2**. The polymer concentration was fixed at 1.0×10^{-5} mol/L and the concentration of the Mg^{2+} ions was 3.0×10^{-5} mol/L. (λ_{Ex} =360 nm, slit: 10 nm/10 nm)

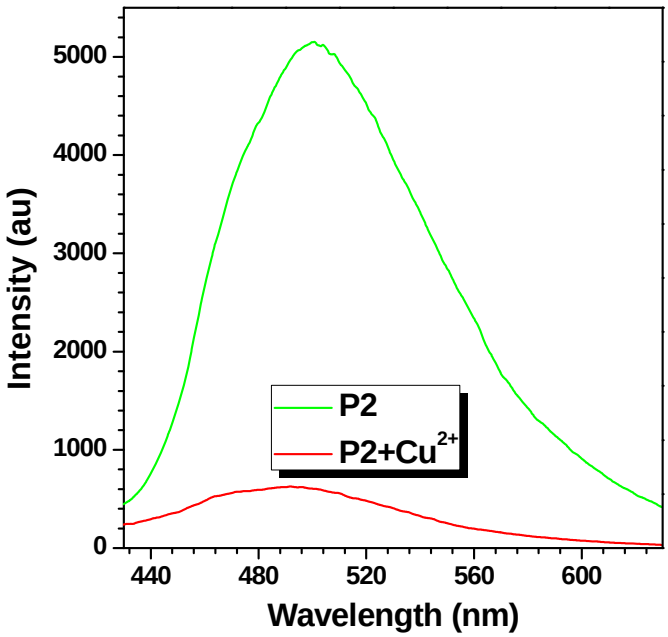


Figure S11. Fluorescence emission response profiles of **P2**. The polymer concentration was fixed at 1.0×10^{-5} mol/L and the concentration of the Cu^{2+} ions was 3.0×10^{-6} mol/L. (λ_{Ex} =360 nm, slit: 10 nm/10 nm)

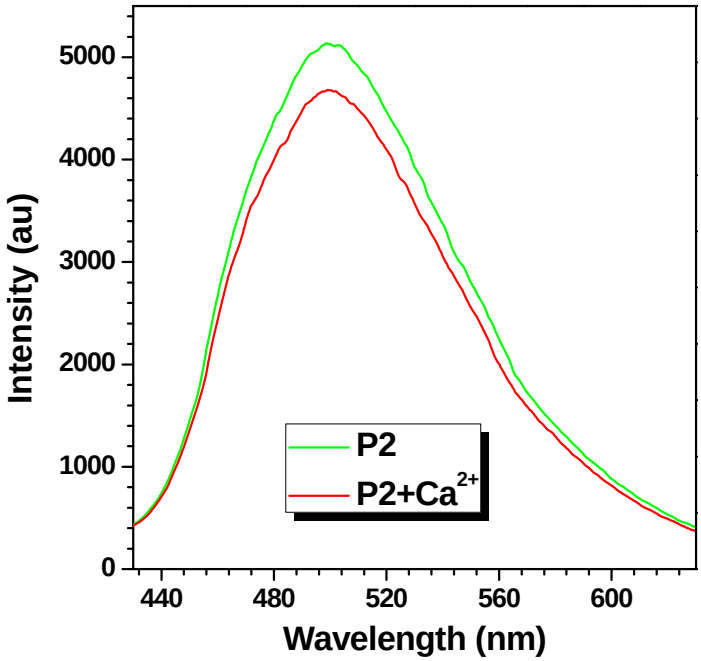


Figure S12. Fluorescence emission response profiles of **P2**. The polymer concentration was fixed at 1.0×10^{-5} mol/L and the concentration of the Ca^{2+} ions was 3.0×10^{-5} mol/L. (λ_{Ex} =360 nm, slit: 10 nm/10 nm)

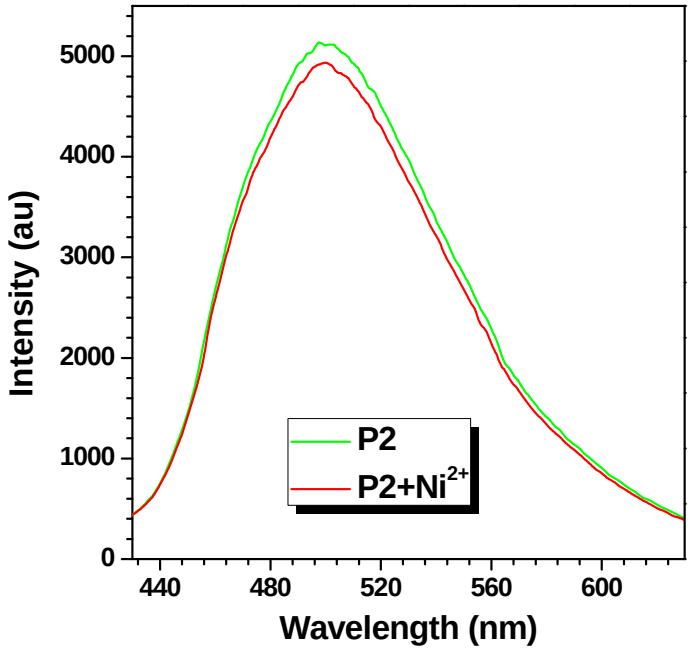


Figure S13. Fluorescence emission response profiles of **P2**. The polymer concentration was fixed at 1.0×10^{-5} mol/L and the concentration of the Ni^{2+} ions was 3.0×10^{-5} mol/L. (λ_{Ex} =360 nm, slit: 10 nm/10 nm)

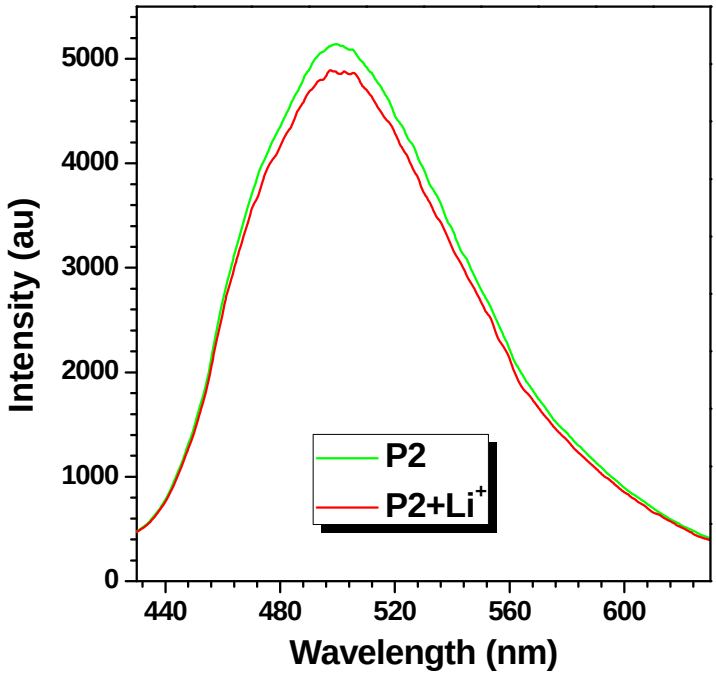


Figure S14. Fluorescence emission response profiles of **P2**. The polymer concentration was fixed at 1.0×10^{-5} mol/L and the concentration of the Li^+ ions was 3.0×10^{-5} mol/L. (λ_{Ex} =360 nm, slit: 10 nm/10 nm)

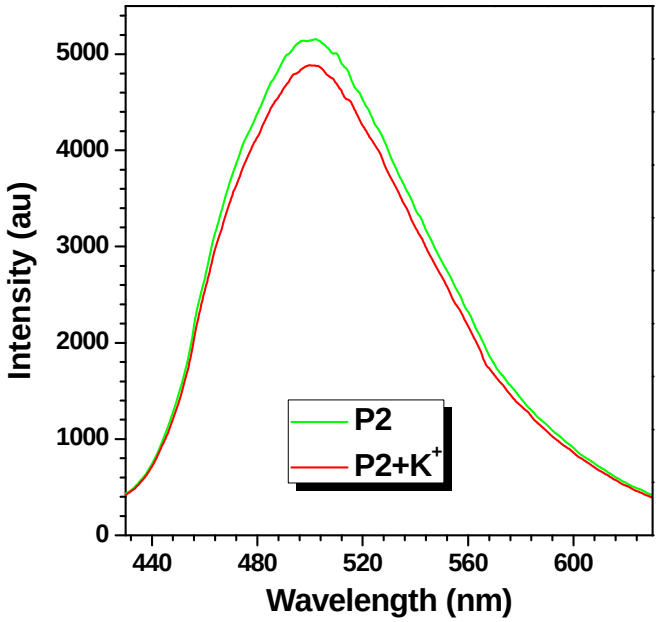


Figure S15. Fluorescence emission response profiles of **P2**. The polymer concentration was fixed at 1.0×10^{-5} mol/L and the concentration of the K^+ ions was 3.0×10^{-5} mol/L. (λ_{Ex} =360 nm, slit: 10 nm/10 nm)

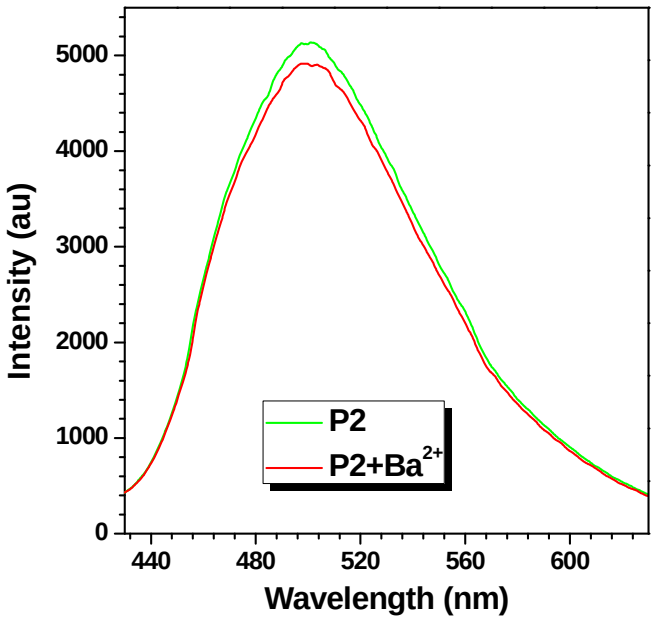


Figure S16. Fluorescence emission response profiles of **P2**. The polymer concentration was fixed at 1.0×10^{-5} mol/L and the concentration of the Ba^{2+} ions was 3.0×10^{-5} mol/L. (λ_{Ex} =360 nm, slit: 10 nm/10 nm)

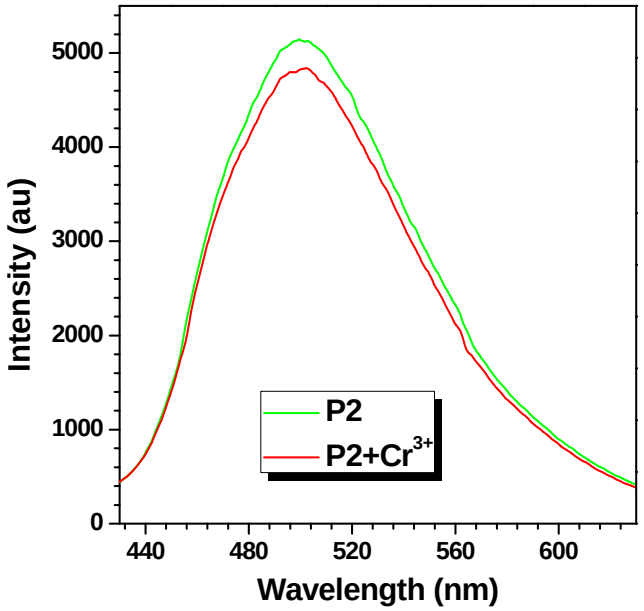


Figure S17. Fluorescence emission response profiles of **P2**. The polymer concentration was fixed at 1.0×10^{-5} mol/L and the concentration of the Cr^{3+} ions was 3.0×10^{-5} mol/L. (λ_{Ex} =360 nm, slit: 10 nm/10 nm)

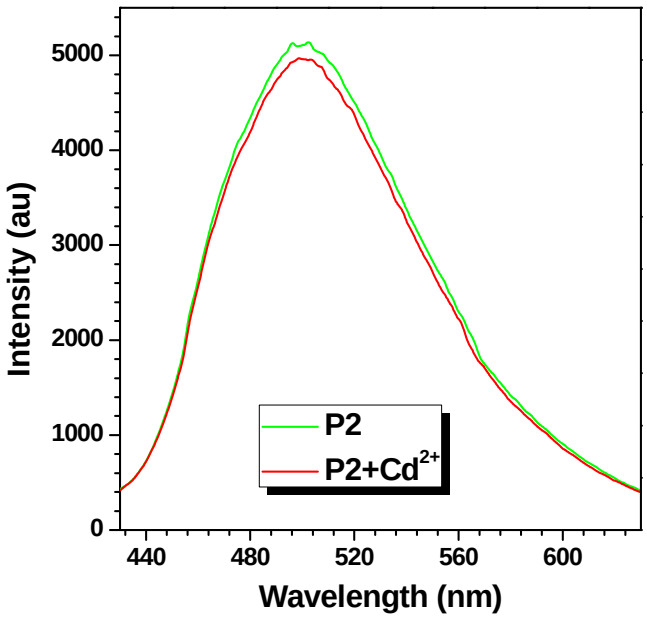


Figure S18. Fluorescence emission response profiles of **P2**. The polymer concentration was fixed at 1.0×10^{-5} mol/L and the concentration of the Cd^{2+} ions was 3.0×10^{-5} mol/L. (λ_{Ex} =360 nm, slit: 10 nm/10 nm)

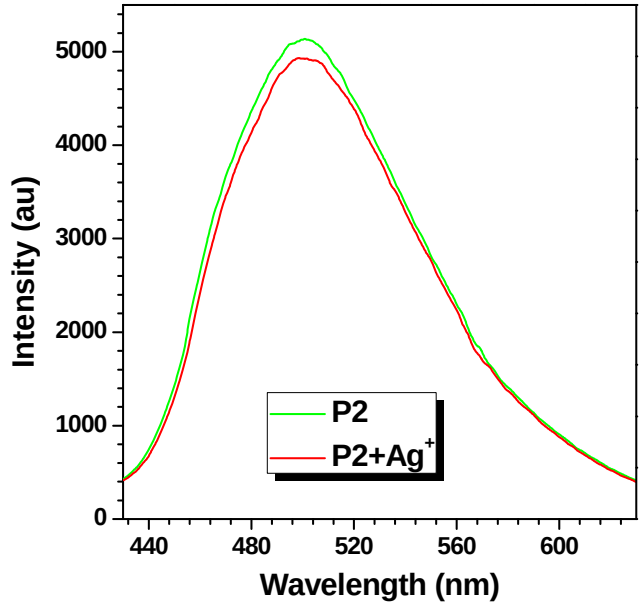


Figure S19. Fluorescence emission response profiles of **P2**. The polymer concentration was fixed at 1.0×10^{-5} mol/L and the concentration of the Ag^{+} ions was 3.0×10^{-5} mol/L. (λ_{Ex} =360 nm, slit: 10 nm/10 nm)

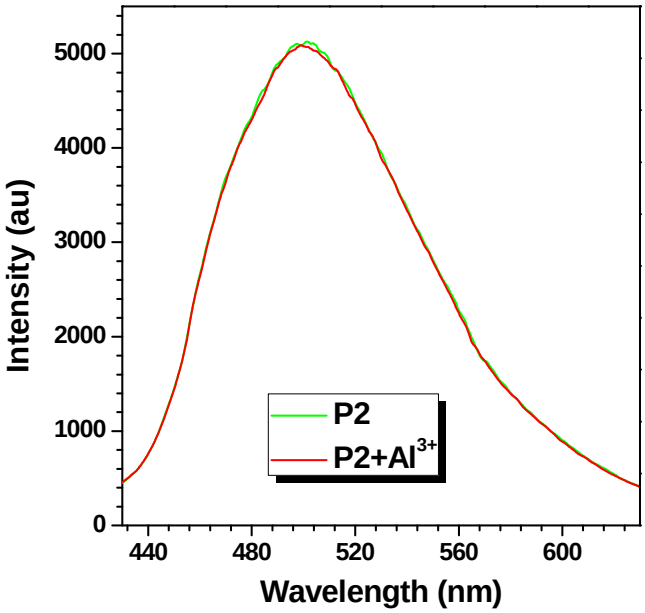


Figure S20. Fluorescence emission response profiles of **P2**. The polymer concentration was fixed at 1.0×10^{-5} mol/L and the concentration of the Al^{3+} ions was 3.0×10^{-5} mol/L. (λ_{Ex} =360 nm, slit: 10 nm/10 nm)

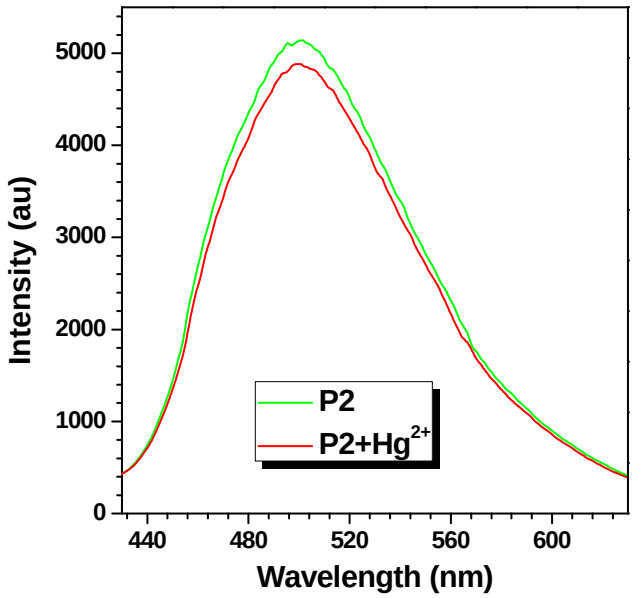


Figure S21. Fluorescence emission response profiles of **P2**. The polymer concentration was fixed at 1.0×10^{-5} mol/L and the concentration of the Hg^{2+} ions was 3.0×10^{-5} mol/L. (λ_{Ex} =360 nm, slit: 10 nm/10 nm)

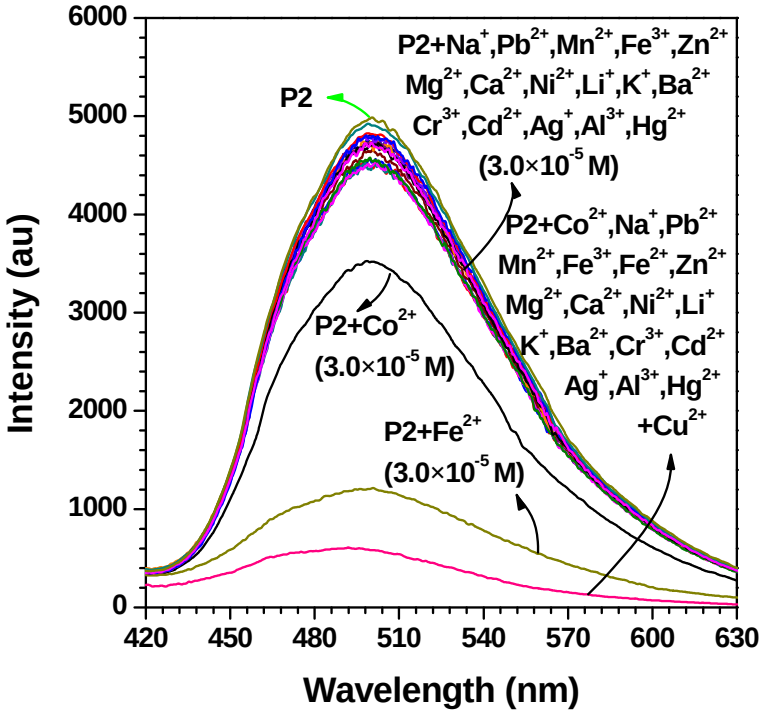


Figure S22. Fluorescence emission spectra of **P2** (1.0×10^{-5} mol/L) in THF-H_2O (1:1, v/v) in the presence of different amounts of metal ions (3.0×10^{-5} mol/L). The concentration of Cu^{2+} was 3.0×10^{-6} mol/L. (λ_{Ex} =360 nm, slit: 10 nm/10 nm)

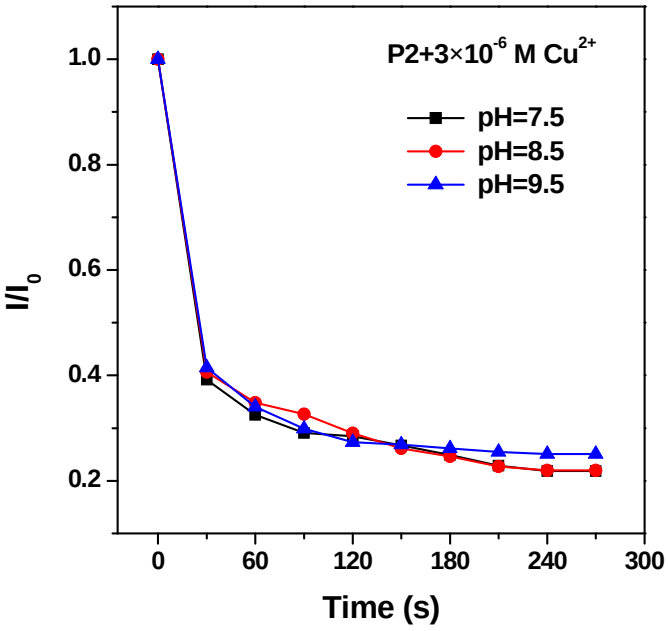


Figure S23. Time courses of the fluorescence response of **P2** (1.0×10^{-5} mol/L) in THF-H_2O (1:1, v/v, 10 mM PBS, pH 7.50, 8.50, 9.50) upon the addition of Cu^{2+} (3.0×10^{-6} mol/L). (λ_{Ex} =360 nm, slit: 10 nm/10 nm)

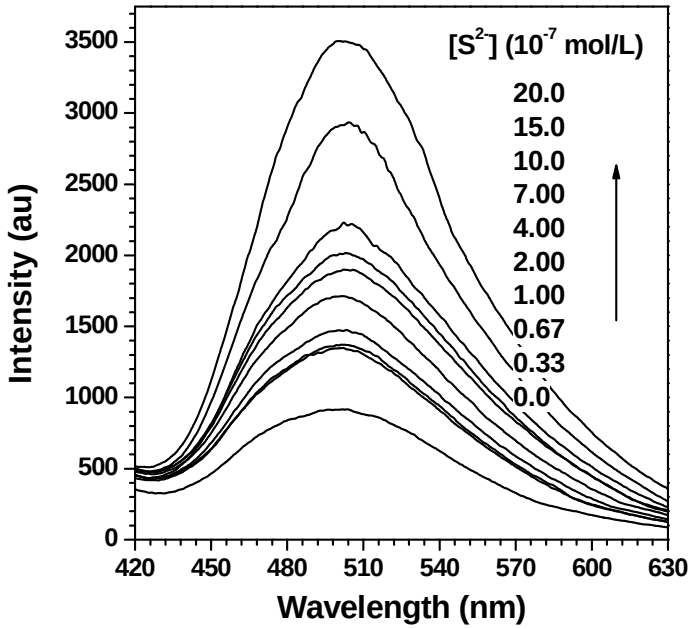


Figure S24a. Fluorescence emission spectra of **P2** in THF-H_2O (1:1, v/v, 10 mM PBS, pH 7.50) before and after the addition of Cu^{2+} and turned on by S^{2-} (Na_2S). The polymer concentration was fixed at 1.0×10^{-5} mol/L while the Cu^{2+} concentration was fixed at 3.0×10^{-6} mol/L. (λ_{Ex} =360 nm, slit: 10 nm/10 nm)

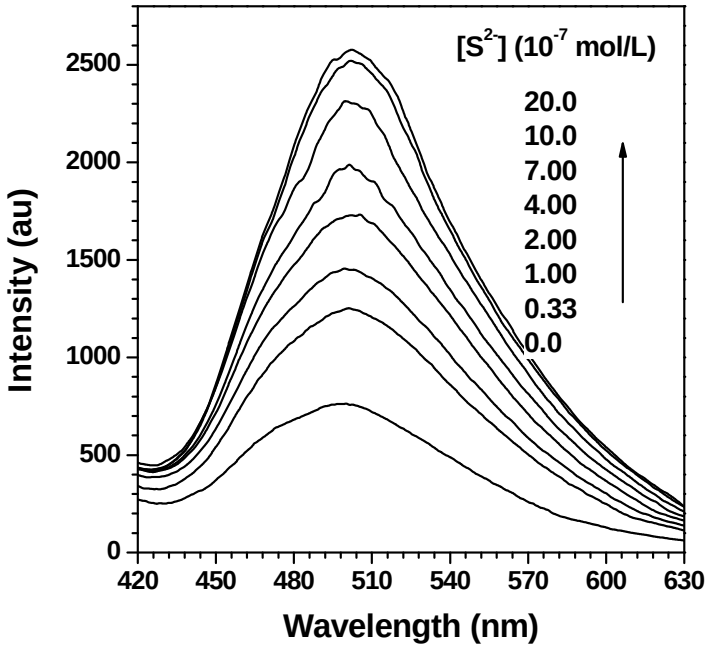


Figure S24b. Fluorescence emission spectra of **P2** in THF-H_2O (1:1, v/v, 10 mM PBS, pH 8.50) before and after the addition of Cu^{2+} and turned on by S^{2-} (Na_2S). The polymer concentration was fixed at 1.0×10^{-5} mol/L while the Cu^{2+} concentration was fixed at 3.0×10^{-6} mol/L. (λ_{Ex} =360 nm, slit: 10 nm/10 nm)

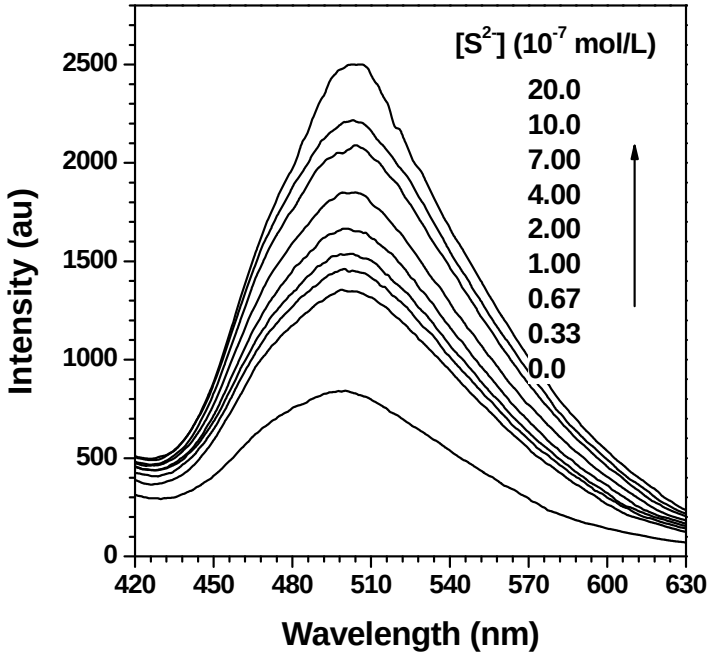


Figure S24c. Fluorescence emission spectra of **P2** in THF-H_2O (1:1, v/v, 10 mM PBS, pH 9.50) before and after the addition of Cu^{2+} and turned on by S^{2-} (Na_2S). The polymer concentration was fixed at 1.0×10^{-5} mol/L while the Cu^{2+} concentration was fixed at 3.0×10^{-6} mol/L. (λ_{Ex} =360 nm, slit: 10 nm/10 nm)

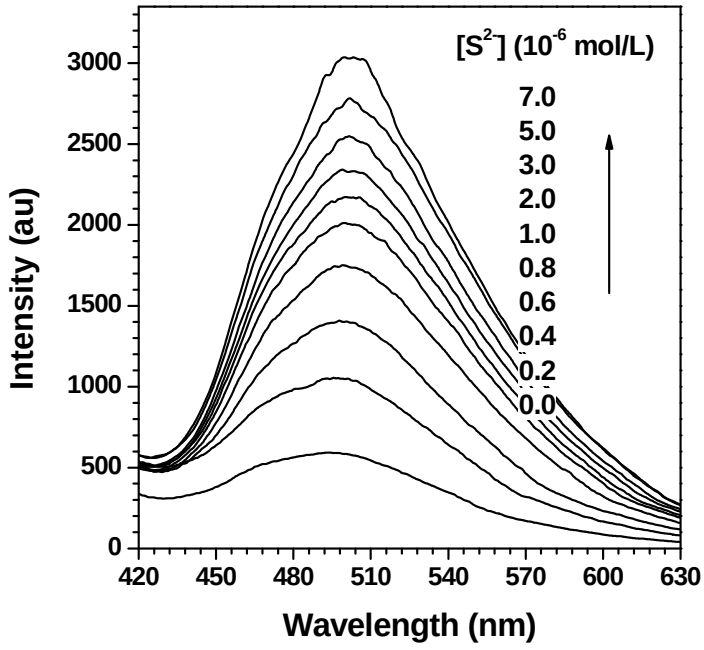


Figure S25. Fluorescence emission spectra of **P2** before and after the addition of Cu^{2+} and turned on by S^{2-} (K_2S). The polymer concentration was fixed at 1.0×10^{-5} mol/L while the Cu^{2+} concentration was fixed at 3.0×10^{-6} mol/L. (λ_{Ex} =360 nm, slit: 10 nm/10 nm)