Supporting materials

A bifunctional sensor based on dirylethene for colorimetric recognition of Cu^{2+} and fluorescent detection of Cd^{2+}

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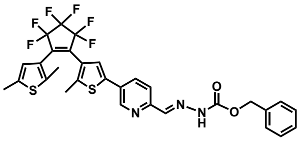
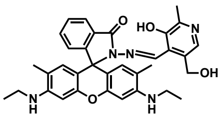
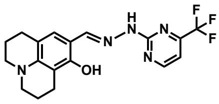
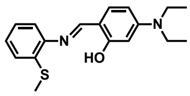
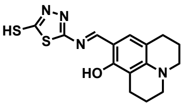
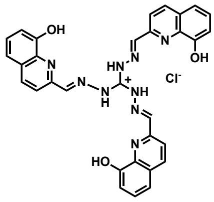
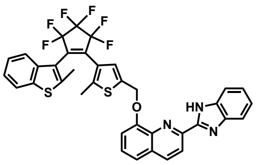
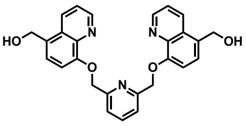
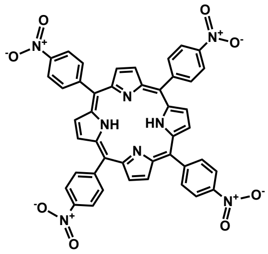
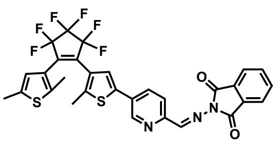
Table S1. Comparative study of the analytical performance of **1o** with other reported sensors.

Structure of sensors	LOD Cu^{2+} (mol L^{-1})	LOD Cd^{2+} (mol L^{-1})	Approaches	Ref.
	8.36×10^{-8}	1.71×10^{-7}	Colorimetry for Cu^{2+}/ Fluorometry for Cd^{2+}	This work
	1.0×10^{-6}	-	Colorimetry	32
	1.9×10^{-7}	-	Colorimetry	68
	3.89×10^{-6}	-	Colorimetry	69
	9.0×10^{-7}	-	Colorimetry	70
	-	5.57×10^{-6}	Fluorometry	71
	-	6.5×10^{-5}	Fluorometry	72
	-	2.165×10^{-7}	Fluorometry	73
	-	2.76×10^{-7}	Fluorometry	74
	4.12×10^{-8}	1.89×10^{-7}	Colorimetry for Cu^{2+}/ Fluorometry for Cd^{2+}	41

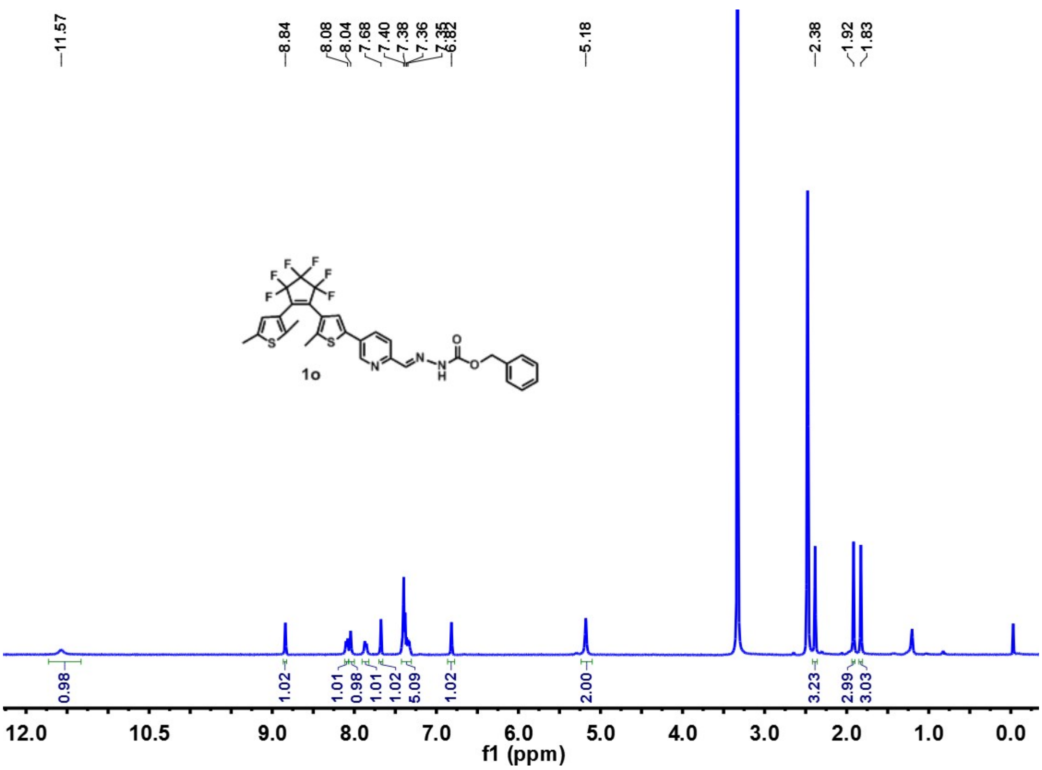


Fig. S1. ^{1}H NMR spectrum of **1o**.

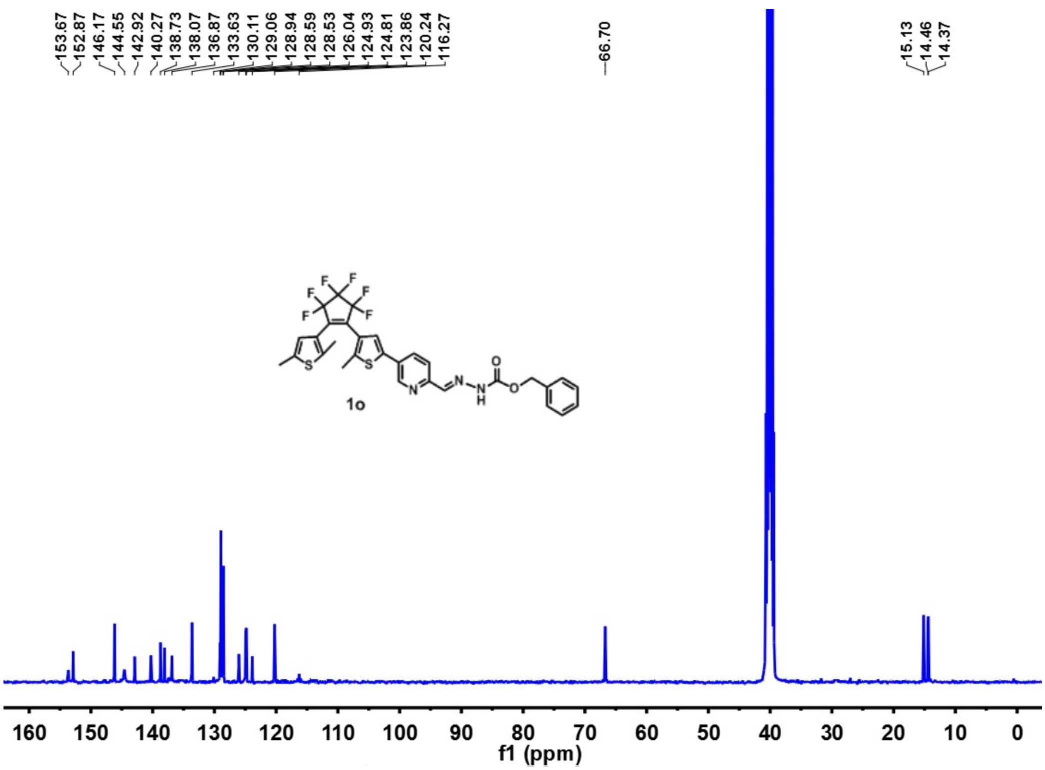


Fig. S2. ^{13}C NMR spectrum of **1o**.

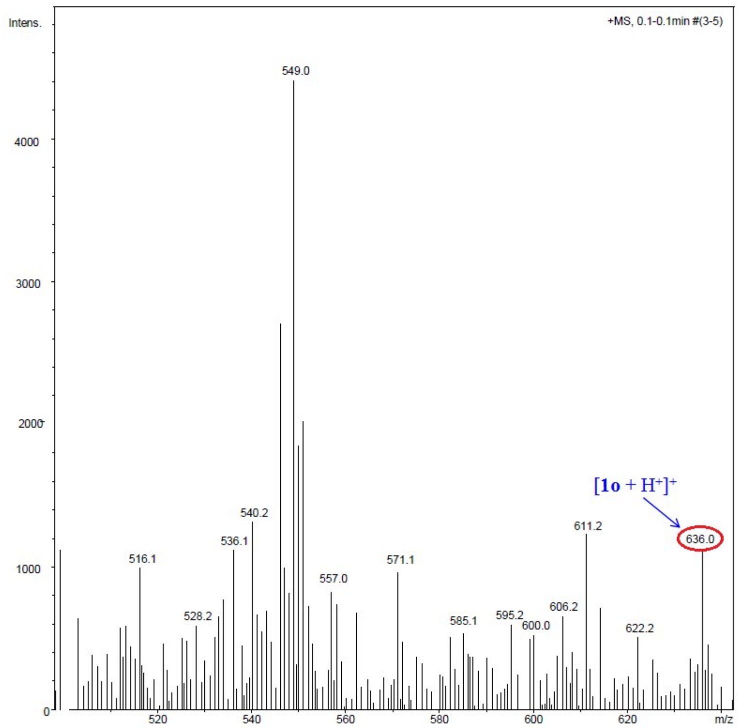


Fig. S3. ESI-MS spectrum of **1o**.

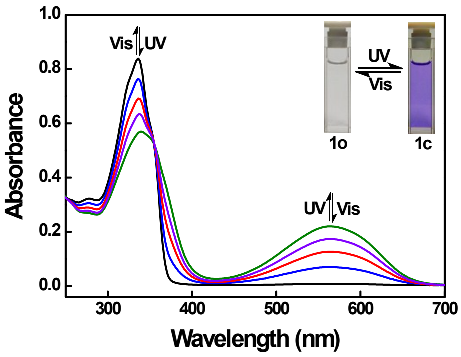


Fig. S4. Changes in the absorption and color of **1o** (2.0×10^{-5} mol L^{-1}) upon irradiation with UV/vis lights in THF.

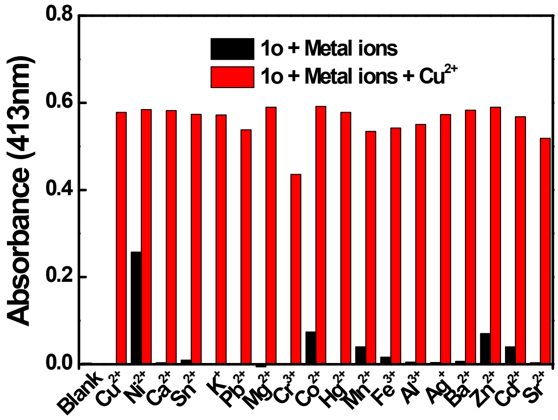


Fig. S5. Competitive tests for the absorption response of **1o** in the presence of Cu^{2+} and other competing metal ions in THF. Black bars represent the absorptions of **1o** solutions in the presence of 1.0 equiv. metal ions and red bars represent the absorptions of **1o** solutions containing the metal ions and Cu^{2+} (2.0×10^{-5} mol L^{-1}).

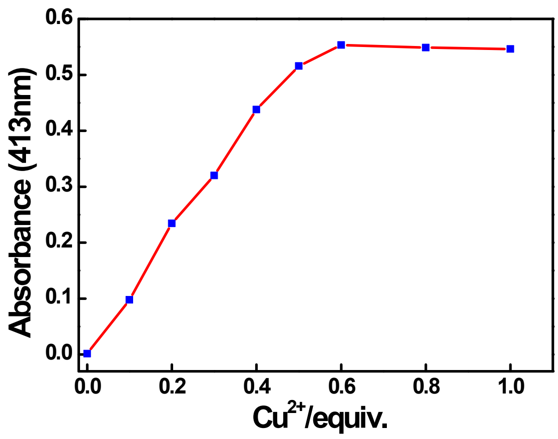


Fig. S6. The absorbance at 413 nm versus the concentration of Cu^{2+}.

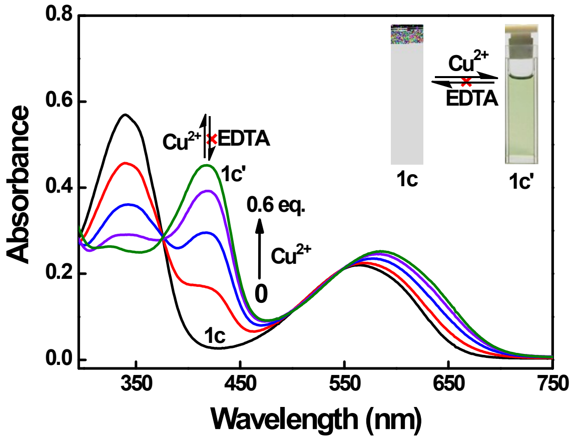


Fig. S7. Absorption spectra and color changes of **1c** in THF (2.0×10^{-5} mol L^{-1}) with the addition of Cu^{2+}.

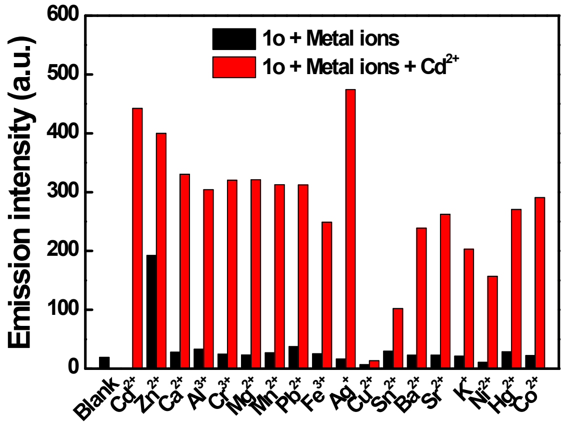


Fig. 8. Competitive tests for the fluorescence responses of **1o** in the presence of Cd^{2+} and other competing metal ions in THF. Black bars represent the emission intensities of **1o** solutions in the presence of 4.0 equiv. metal ions and red bars represent the emission intensities of **1o** solutions containing the metal ions and Cd^{2+} (2.0×10^{-5} mol L^{-1}).

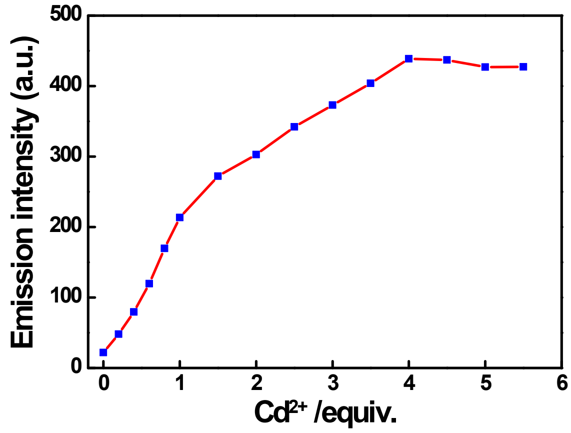


Fig. S9. The emission intensity at 470 nm versus the concentration of Cd^{2+}.

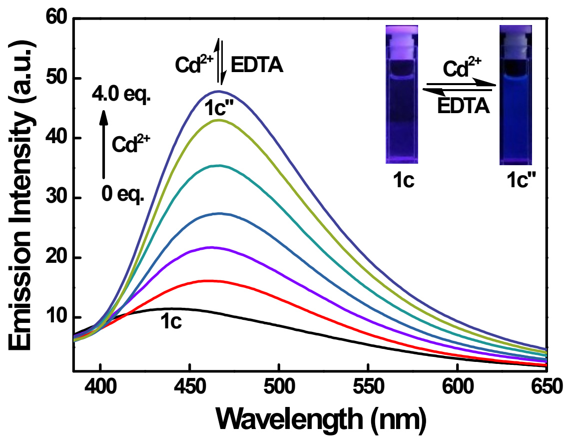


Fig. S10. Fluorescence spectra and color changes of **1c** (2.0×10^{-5} mol L^{-1} in THF) induced by Cd^{2+} (0 - 4.0 equiv.).

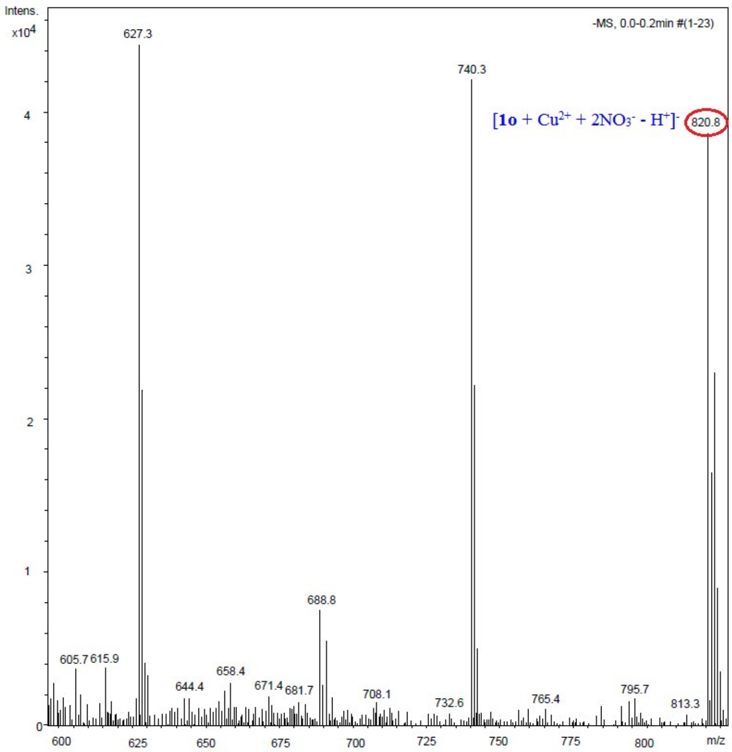


Fig. S11. ESI-MS spectrum of **1o**-Cu^{2+}.

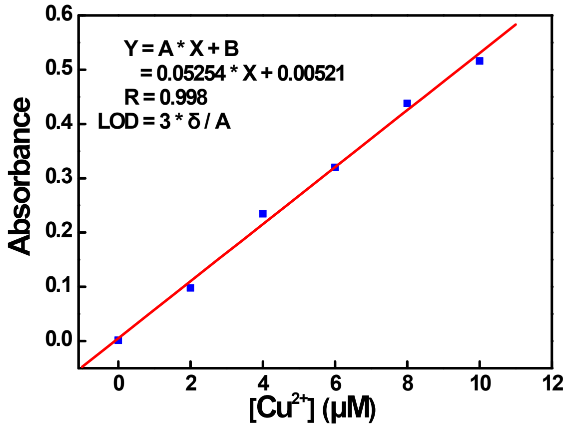


Fig. S12. The limit of detection (LOD) for Cu^{2+} is 8.36×10^{-8} mol L^{-1}.

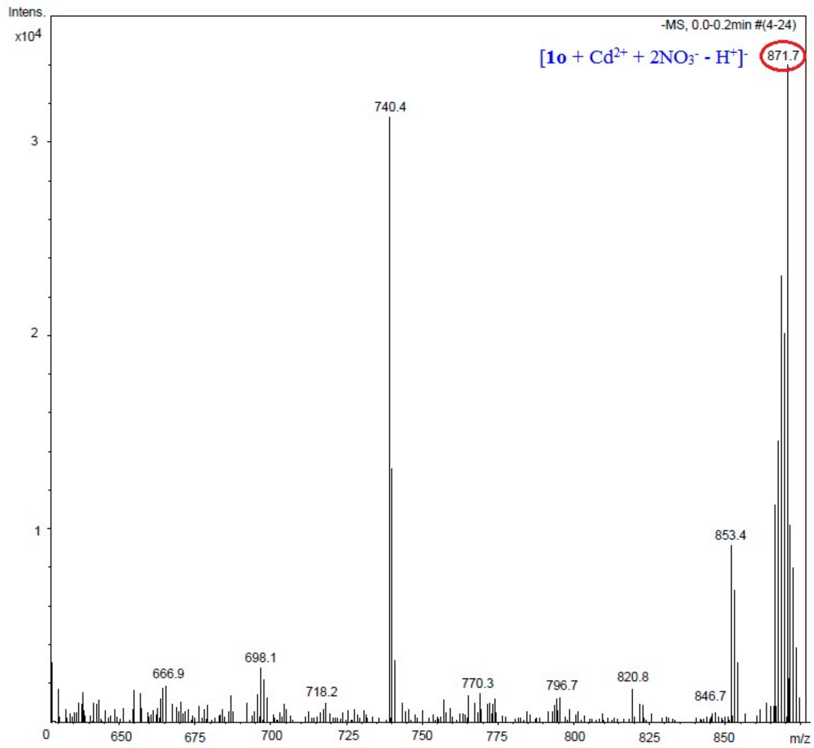


Fig. S13. ESI-MS spectrum of **1o-**Cd^{2+}.

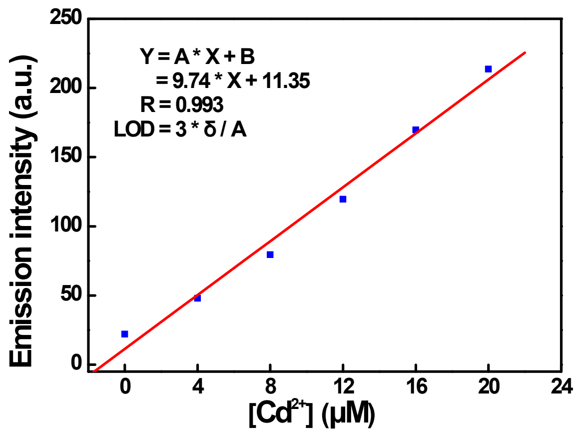


Fig. S14. The limit of detection (LOD) for Cd^{2+} is 1.71×10^{-7} mol L^{-1}.

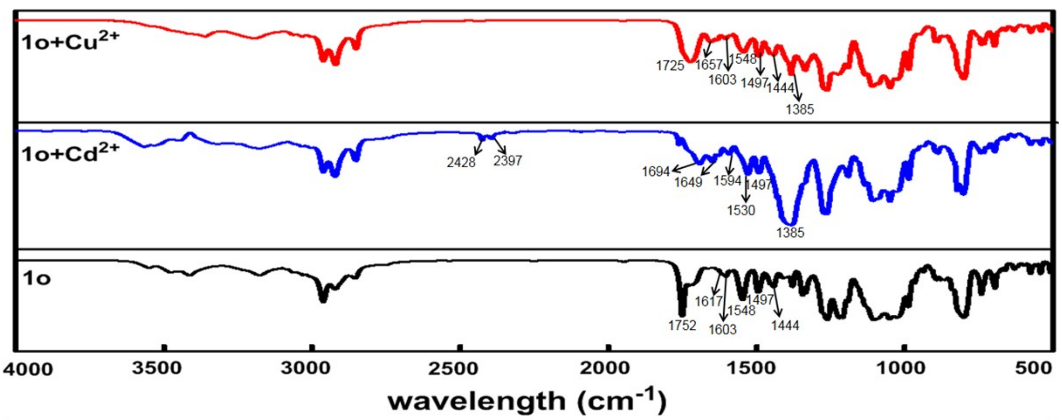


Fig. S15. IR spectra of **1o**, **1o**-Cu^{2+} and **1o**-Cd^{2+} in KBr disks.

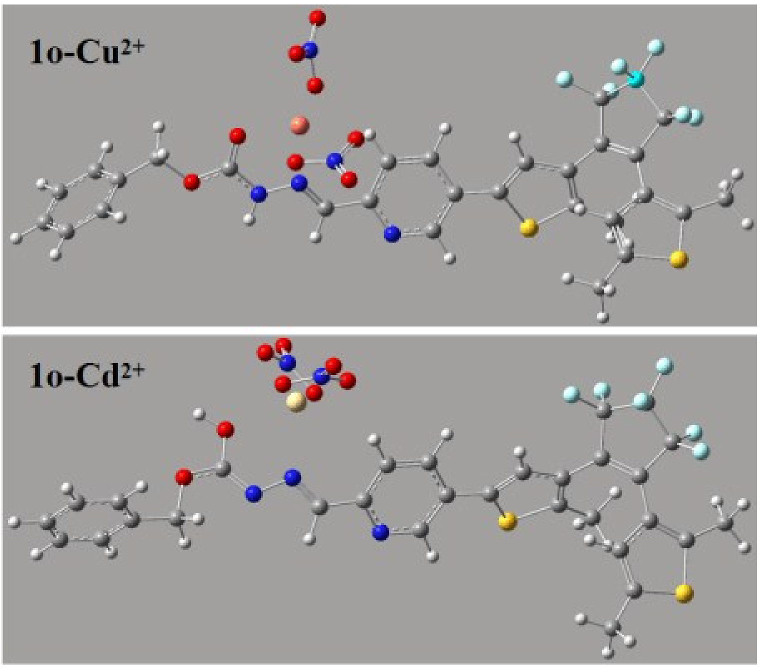


Fig. S16. The optimized structure of **1o**-Cu^{2+} and **1o**-Cd^{2+}.