Supporting Information

Nano Molar Detection of Cd(II) Ions by Luminescent Metallo-Supramolecular Polymer Formation

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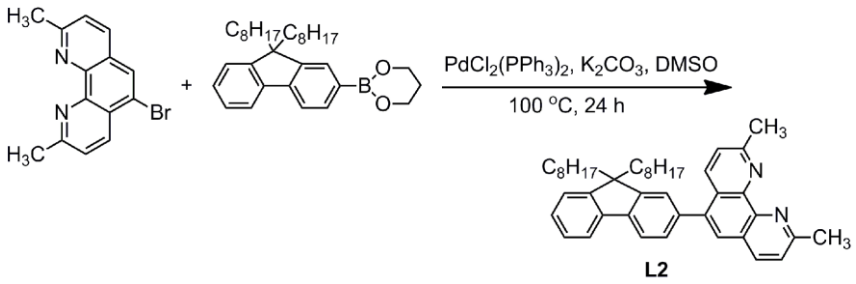
1. Synthetic scheme and NMR spectra of L2



Scheme S1. Synthesis of **L2**.

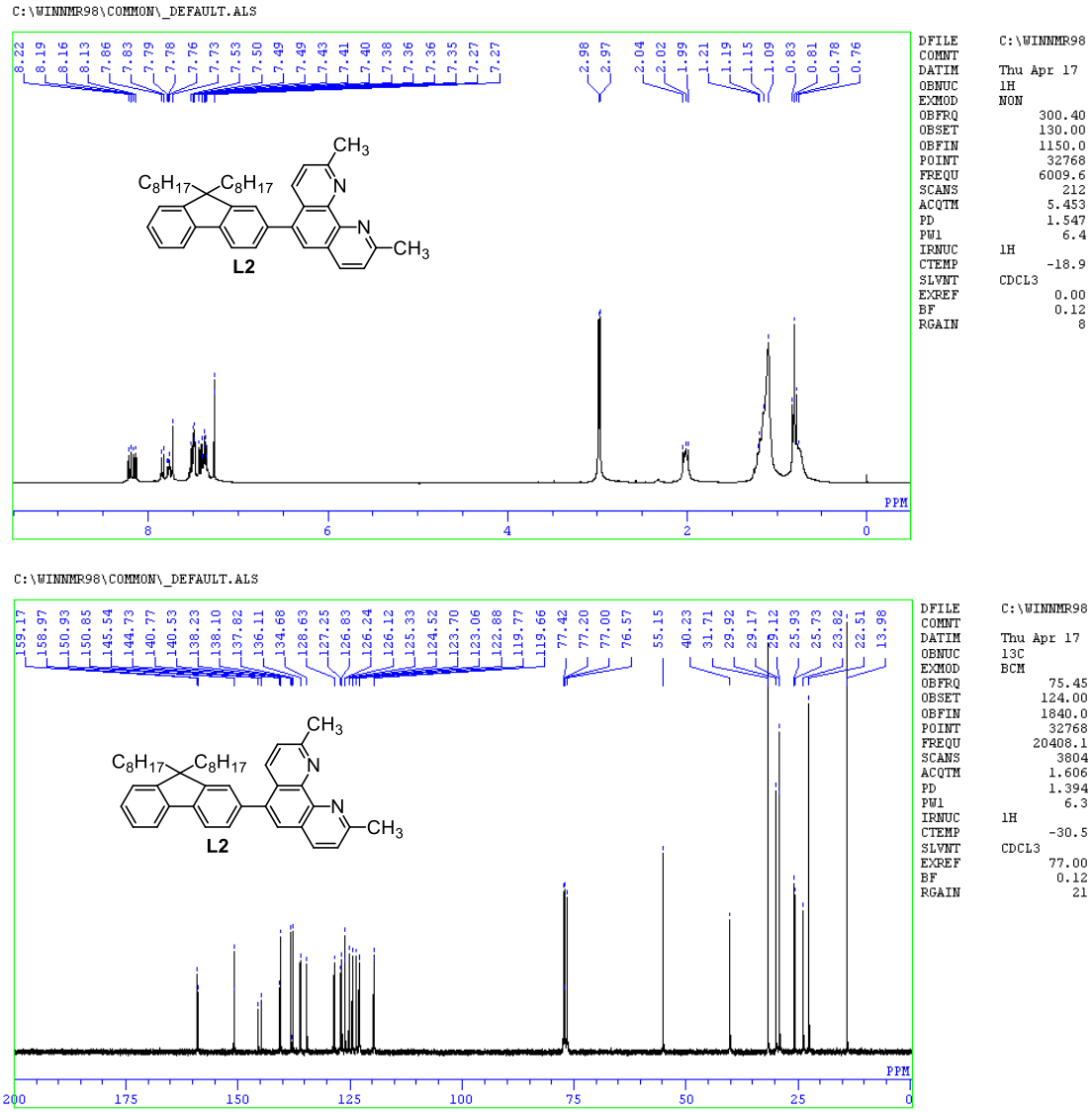


Figure S1. ^{1}H- and ^{13}C-NMR spectra of **L2**.

2. Molecular weight measurement

Molecular weight of metallo-supramolecular polymer[1] was determined by SEC-viscometry–RALLS (size exclusion chromatography-viscometry-right angle light scattering solvent) system consisting of a pump, solvent degasser, liquid chromatograph, refractive index detector, column oven, viscotek 270 dual detector. The eluent was acetonitrile at a flow speed of 1 mL/min. The column temperature was 30 ^{o}C. The synthesized polymers (c =1.0 mg/mL) show weight-average molecular weight using polyethylene oxide-PEO-22K as standard, when 20 μL of acetonitrile solution was injected. The molecular weight was obtained by automatic program calculation taking account of viscosity and RALLS factor into consideration. The representative figure of **polyCd** for molecular weight is shown in **Figure S3**.

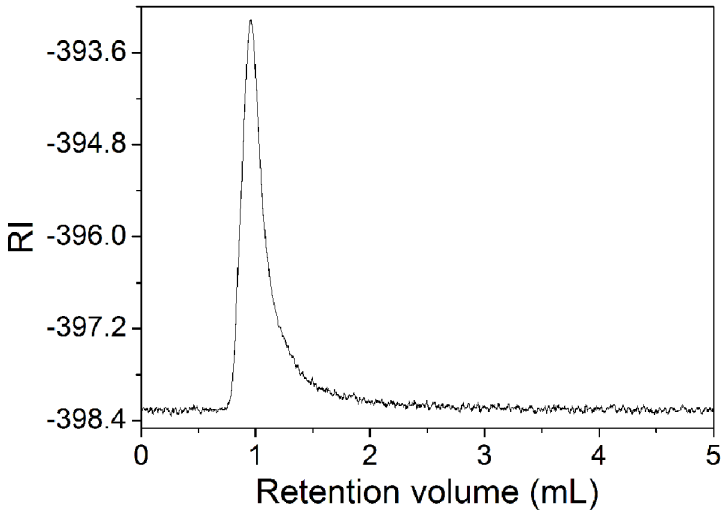


Figure S2. The elution peak of **polyCd** in SEC-viscometry–RALL in acetonitrile at room temperature.

3. Cd-Cd distance in polyCd

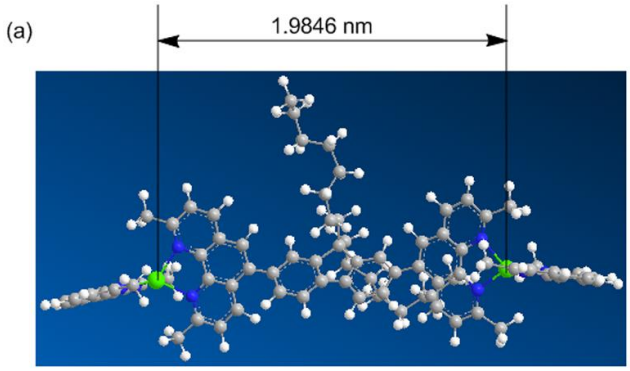


Figure S3. Intermetal distance of Cd ions in **polyCd**.

4. IR spectra of polyCd and L2-Cd-L2

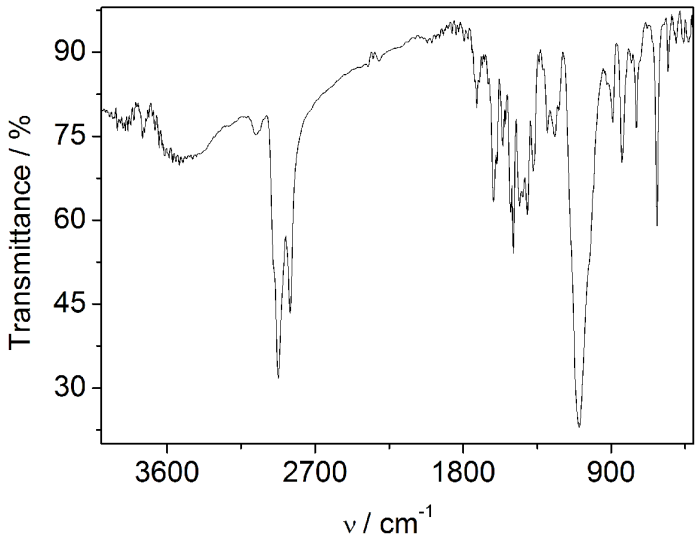


Figure S4. IR spectrum of **polyCd**.

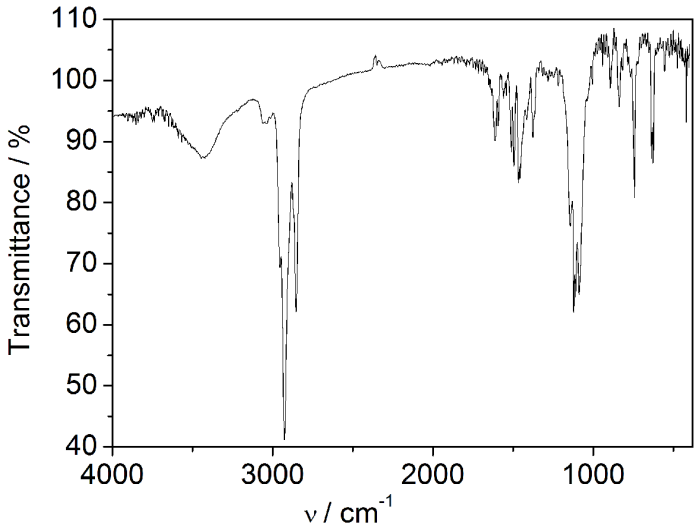


Figure S5. IR spectrum of **L2-Cd-L2**.

5. UV spectra of L1 and polyCd

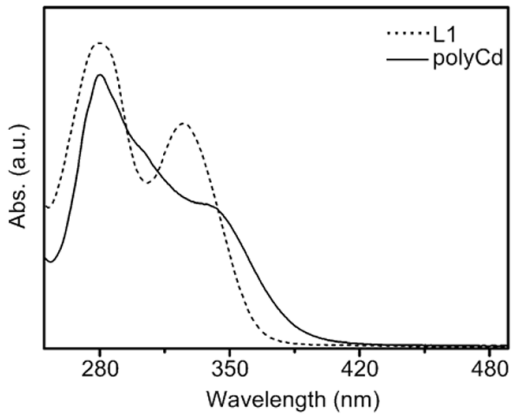


Figure S6. UV-vis spectra of **L1** (1×10^{-5} M in CH_2Cl_2) and **polyCd** (1×10^{-5} M in CH_3CN).

6. UV spectra of L2 and L2-Cd-L2

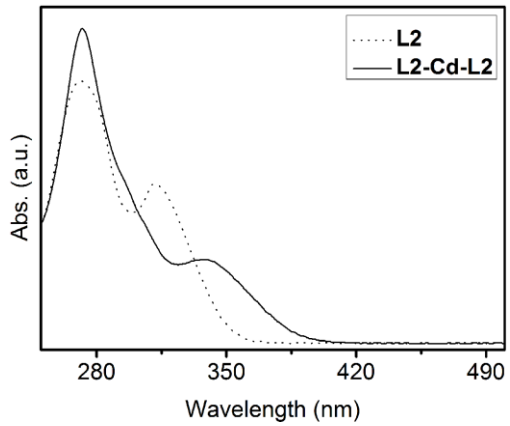


Figure S7. UV-vis spectra of **L2** (1×10^{-5} M in CH_2Cl_2) and **L2-Cd-L2** (1×10^{-5} M in CH_3CN).

7. UV-vis spectral titration in the synthesis of L2-Cd-L2

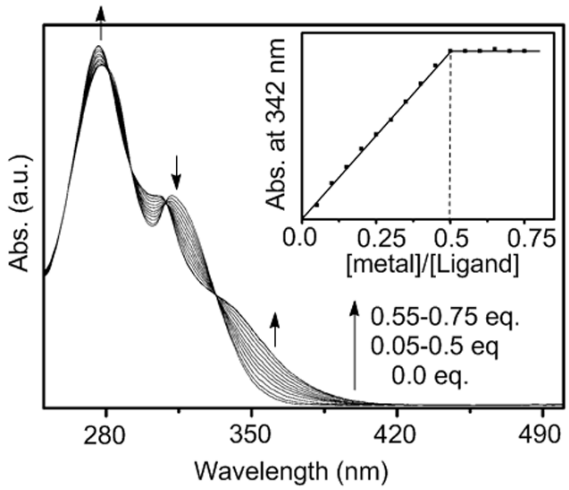


Figure S8. UV-vis spectral changes in the titration of the $Cd(ClO_4)_2.6H_2O$ solution (CH_3CN, c = 5 × 10^{-4} M) to an **L2** solution (CH_2Cl_2, c = 1.0 × 10^{-5} M, *l* = 1 cm) at rt. The arrows indicate the direction of spectral changes. The inset shows the change in abs. at 342 nm as a function of added Cd(II) salt.

8. Binding constants of polyCd and L2-Cd-L2

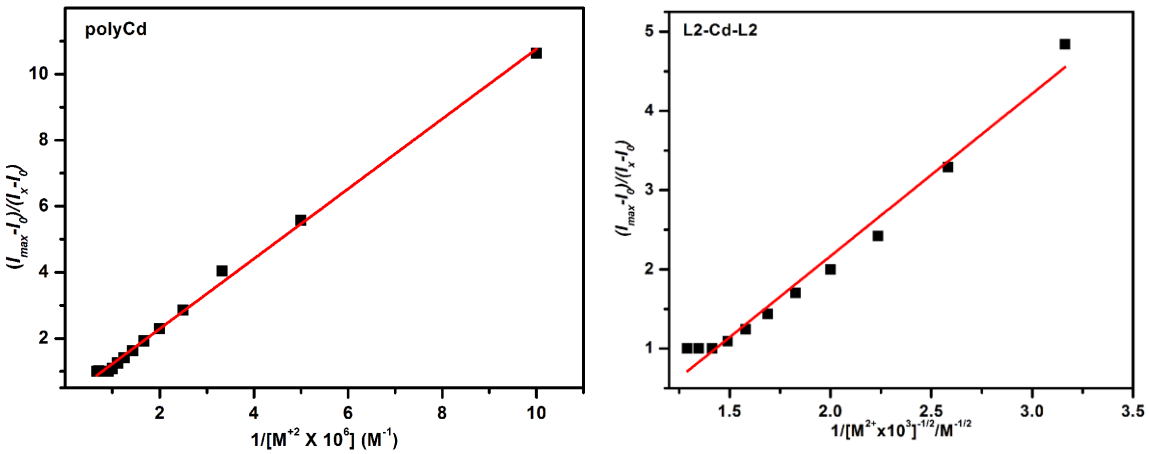


Figure S9. Binding constants of **polyCd** and **L2-Cd-L2**.

9. Emission spectra of L2 and L2-Cd-L2

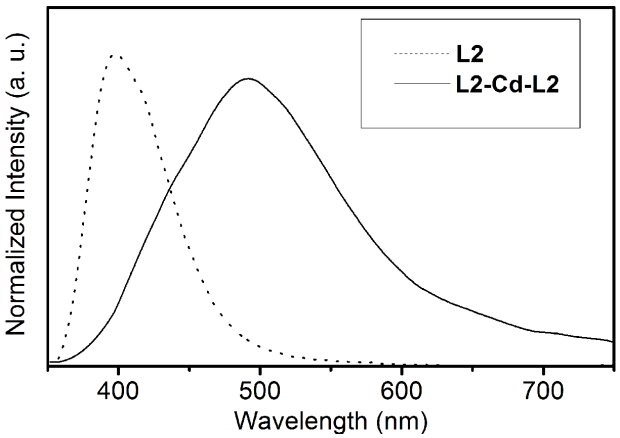


Figure S10. Emission spectra of **L2** (1×10^{-5} M in CH_2Cl_2) and **L2-Cd-L2** (1×10^{-5} M in CH_3CN) at rt.

10. Reference

[1] M. Chiper, M. A. R. Meier, J. M. Johannes, U. S. Schubert, *Macromol. Chem. Phys.* 2007, **208**, 679.