

Supporting Information

Post-Synthetic Modification of a Two-Dimensional Metal-Organic Framework via Photodimerization Enables Highly Selective Luminescent Sensing of Aluminum(III)

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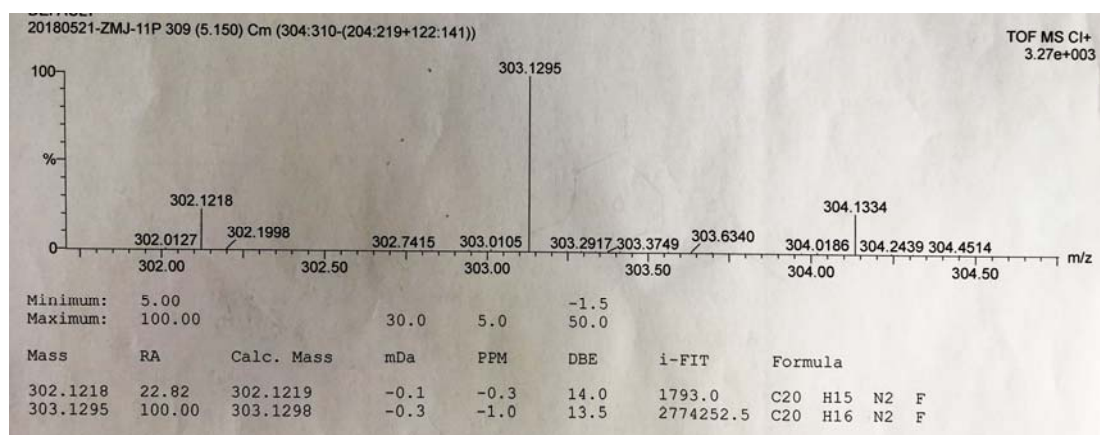


Figure S1. HRMS spectrum of 5-F-1,3-bpeb.

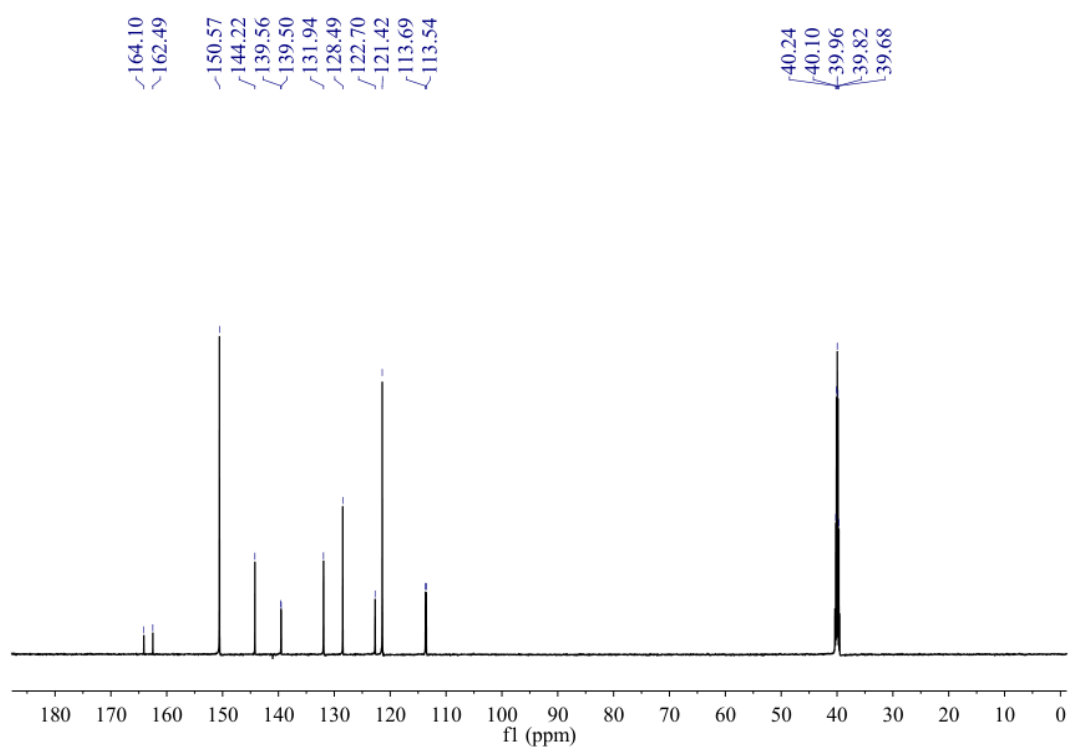
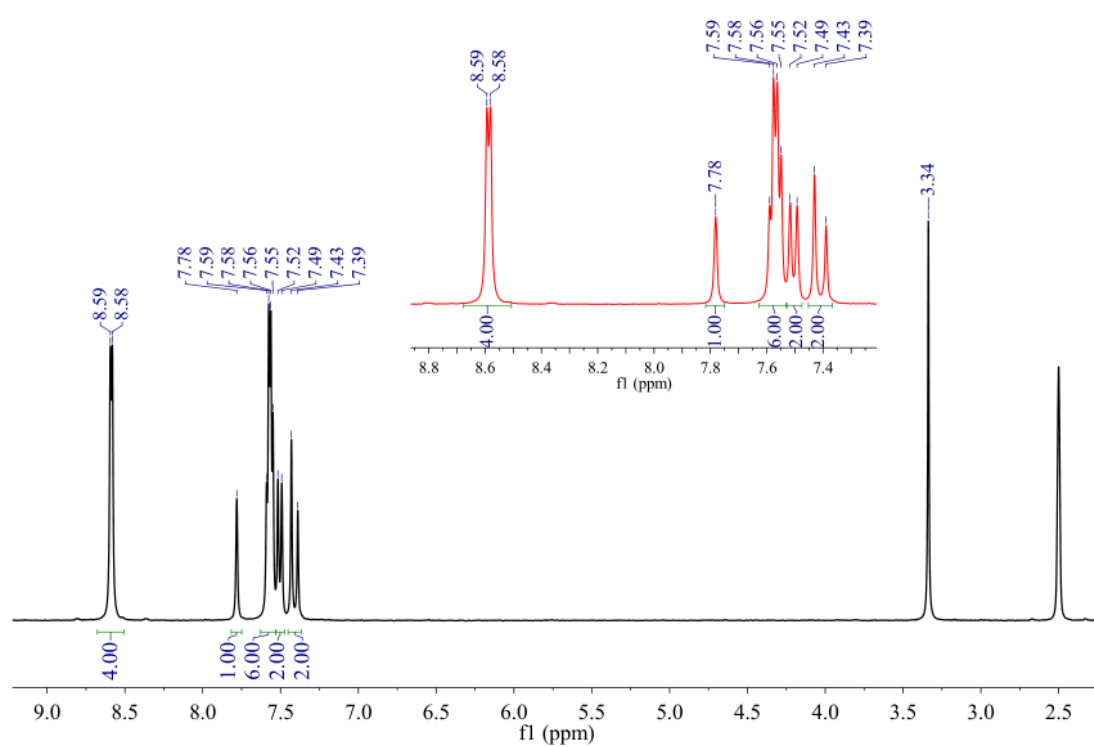


Figure S2. The ¹H and ¹³C NMR spectra of 5-F-1,3-bpeb.

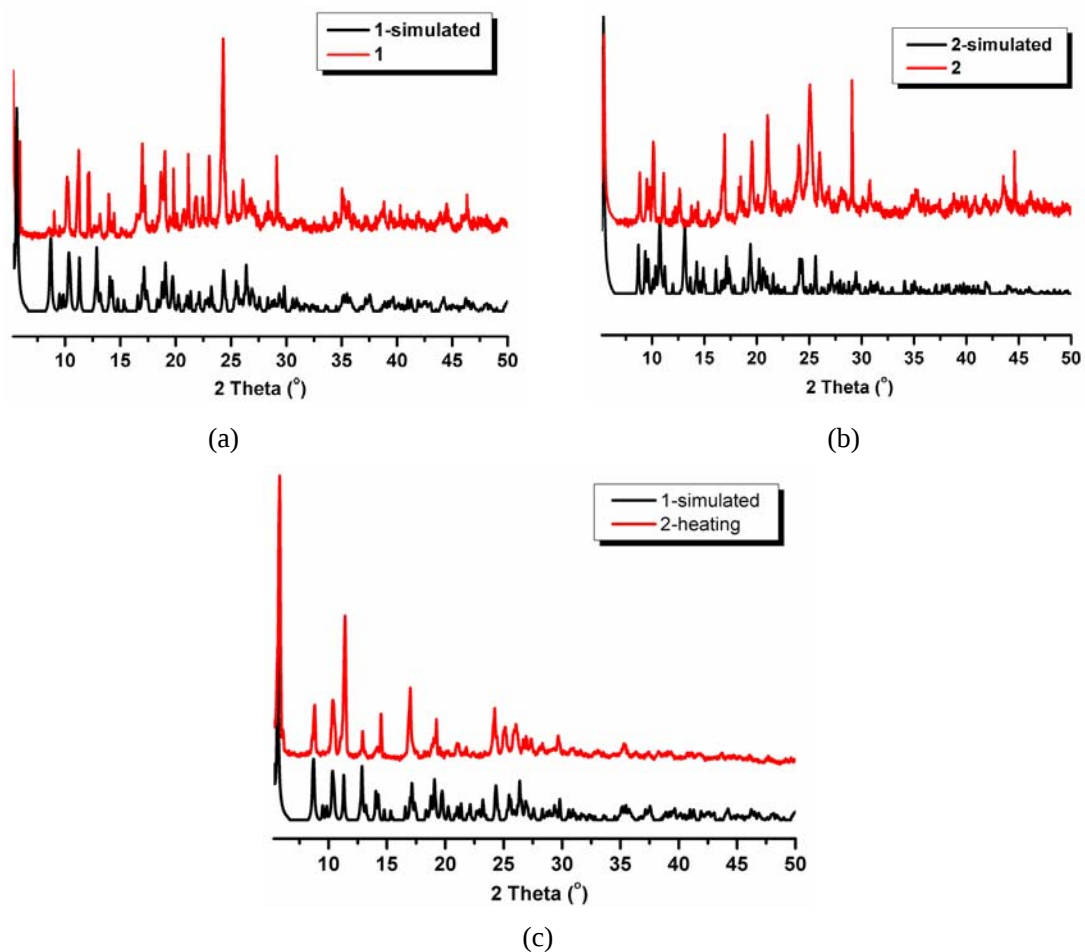


Figure S3 PXRD patterns for 1 and 2.

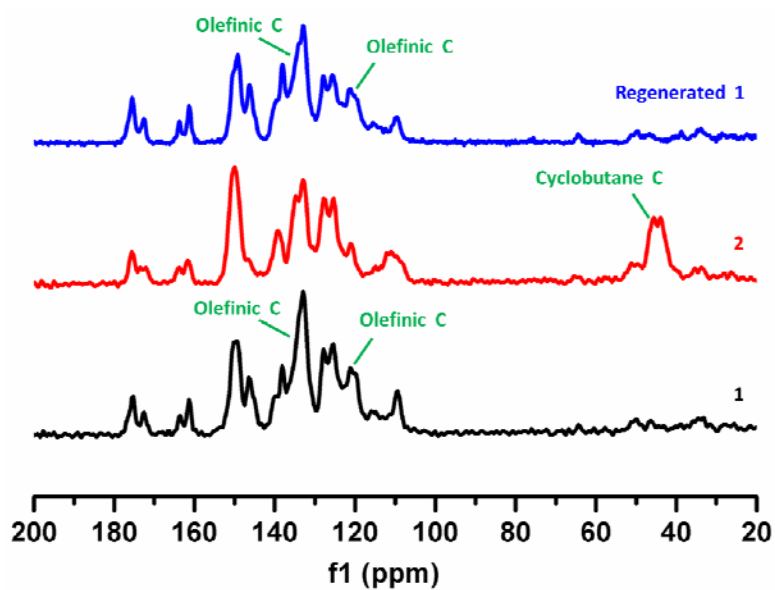


Figure S4. ^{13}C CP/MAS NMR spectra of 1 (black line), 2 (red line), and regenerated 1 (blue line).

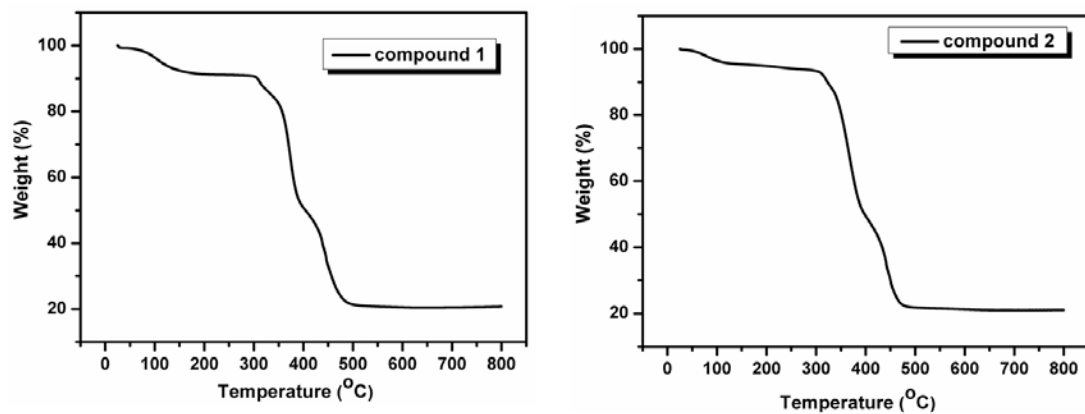


Figure S5. The TGA curves for **1** and **2**.

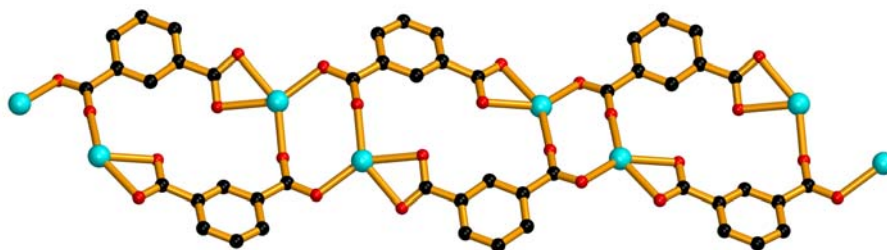


Figure S6. View of a section of the 1D chain $[\text{Cd}_2(1,3\text{-BDC})_2]_n$ in **1**.

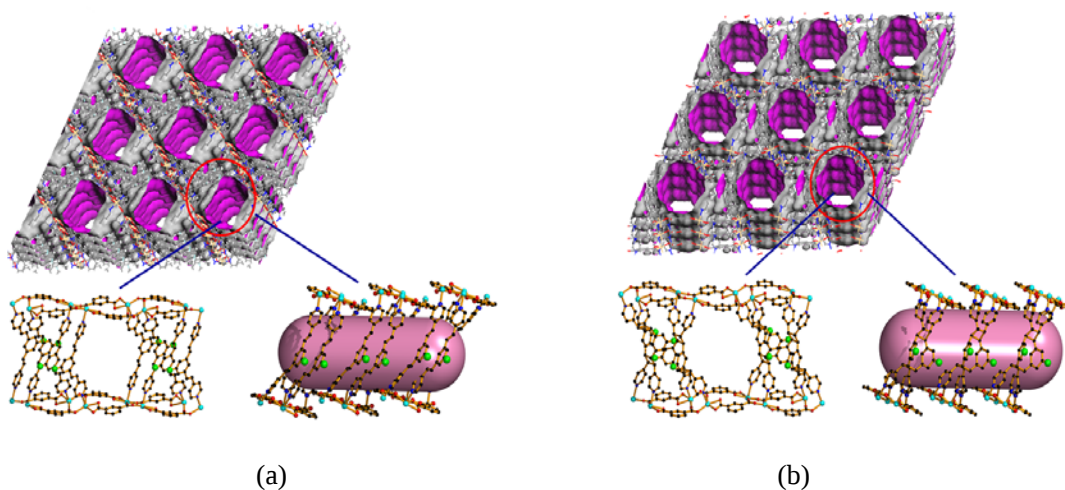


Figure S7. View of the 3D network with 1D channels of **1** (a) or **2** (b).

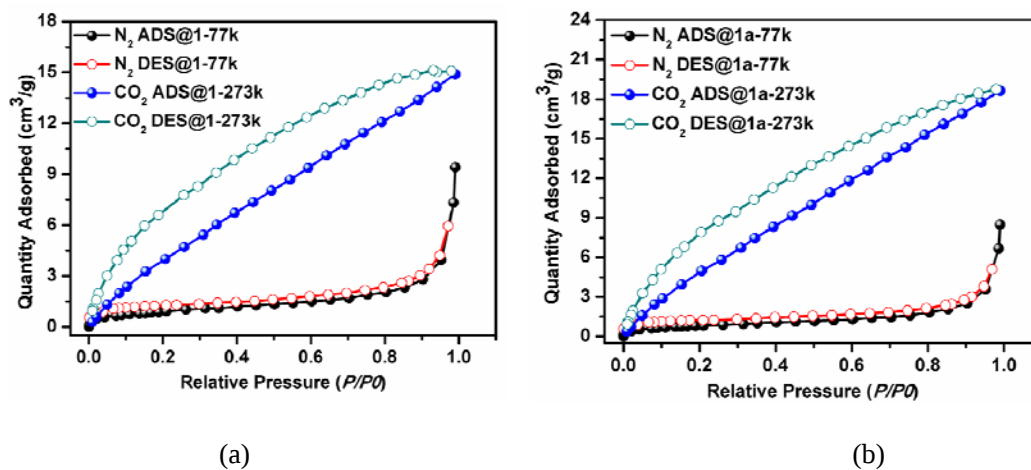


Figure S8. The gas absorption-desorption isotherms of **1** (a) and **2** (b).

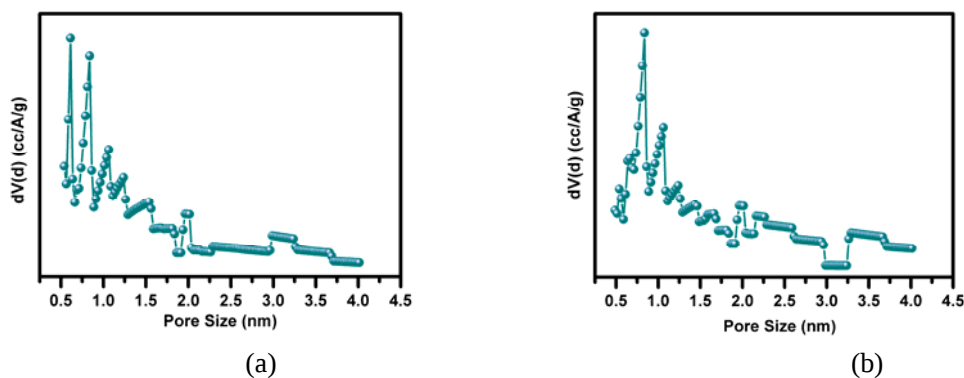


Figure S9. Pore size distributions for **1** (a) and **2** (b).

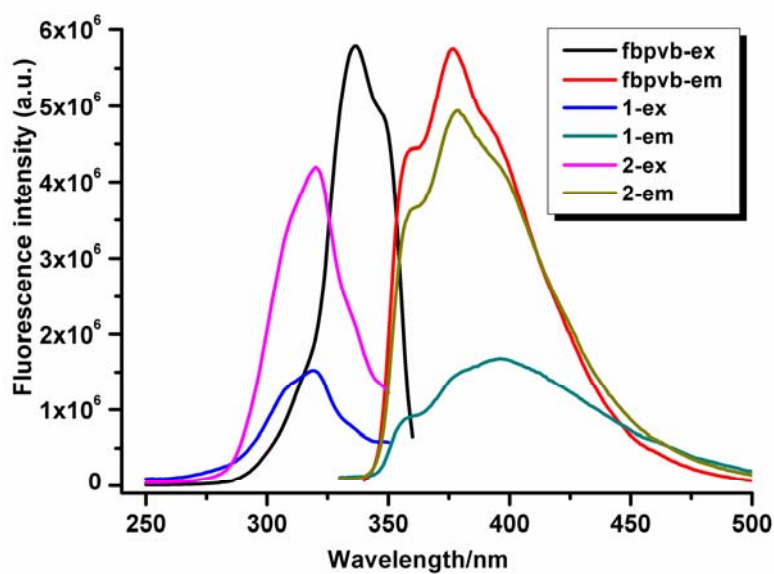


Figure S10. Excitation and emission spectra of 5-F-1,3-bpeb, **1** and **2** in CH₃CN.

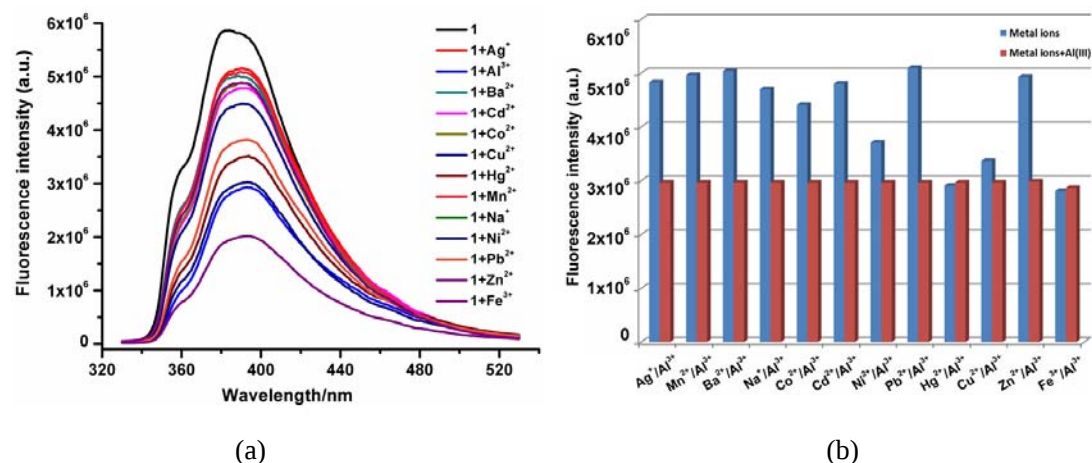


Figure S11. (a) Emission spectra of **1** in CH_3CN upon addition of different metal ions. (b) Interference study of **1** in CH_3CN for Al^{3+} with different metal ions.

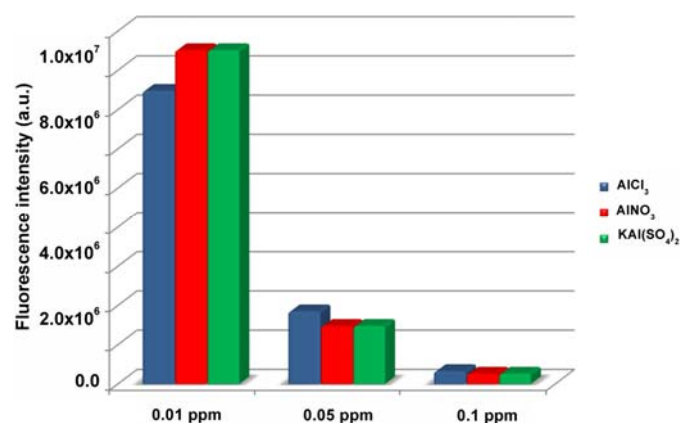


Figure S12. The influence of Al salts on the luminescence intensity of **2** in MeCN.

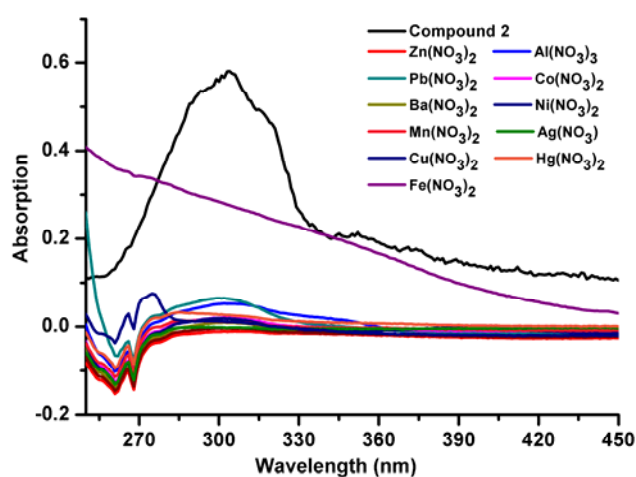


Figure S13. UV-Vis adsorption spectra of compound **2** and various metal nitrates in MeCN.

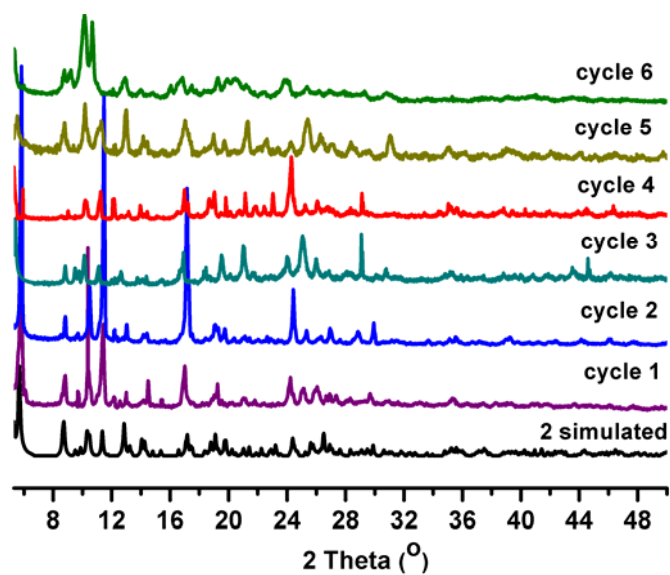


Figure S14. The PXRD patterns for **2** after sensing cycle of Al^{3+} .

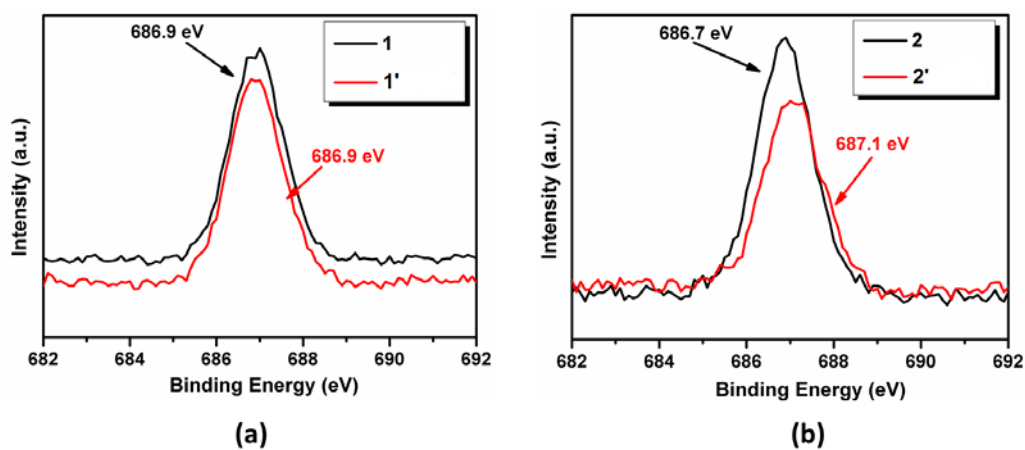


Figure S15. XPS spectra of **1** (black line), **1'** (derived from immersing **1** into Al^{3+} solution; red line), **2** (black line) and **2'** (derived from immersing **2** into Al^{3+} solution; red line).

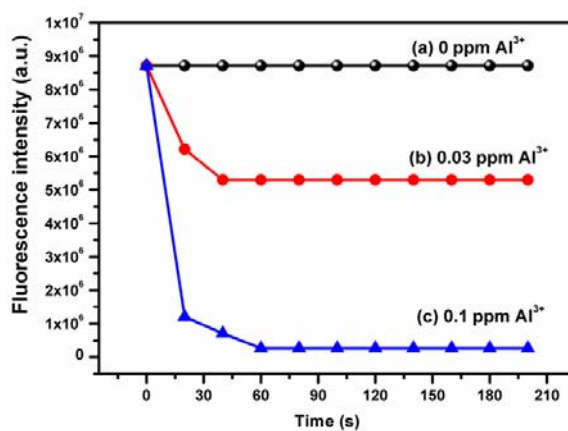


Figure S16. Time-course monitoring of the fluorescence intensity of **2**.

Table S1. Selected Bond Lengths (Å) and Angles (deg) for **1** and **2**.

1			
Cd(1)-O(1)	2.234(3)	Cd(1)-O(2A)	2.278(3)
Cd(1)-N(1)	2.315(4)	Cd(1)-N(4B)	2.319(3)
Cd(1)-O(6C)	2.365(3)	Cd(1)-O(5C)	2.416(3)
Cd(2)-N(3)	2.293(3)	Cd(2)-N(2)	2.294(3)
Cd(2)-O(7)	2.309(3)	Cd(2)-O(8D)	2.307(3)
Cd(2)-O(4E)	2.350(3)	Cd(2)-O(3E)	2.406(3)
O(1)-Cd(1)-O(2A)	122.63(10)	O(1)-Cd(1)-N(1)	94.60(13)
O(2A)-Cd(1)-N(1)	87.99(12)	O(1)-Cd(1)-N(4B)	87.95(11)
O(2A)-Cd(1)-N(4B)	86.07(11)	N(1)-Cd(1)-N(4B)	174.01(12)
O(1)-Cd(1)-O(6C)	147.24(10)	O(2A)-Cd(1)-O(6C)	89.57(10)
N(1)-Cd(1)-O(6C)	92.23(13)	N(4B)-Cd(1)-O(6C)	88.51(11)
O(1)-Cd(1)-O(5C)	93.01(10)	O(2A)-Cd(1)-O(5C)	144.26(10)
N(1)-Cd(1)-O(5C)	92.02(12)	N(4B)-Cd(1)-O(5C)	93.26(11)
O(6C)-Cd(1)-O(5C)	54.71(9)	N(3)-Cd(2)-N(2)	176.15(12)
N(3)-Cd(2)-O(7)	87.04(12)	N(2)-Cd(2)-O(7)	89.12(12)
N(3)-Cd(2)-O(8D)	90.54(11)	N(2)-Cd(2)-O(8D)	91.82(12)
O(7)-Cd(2)-O(8D)	128.14(10)	N(3)-Cd(2)-O(4E)	92.22(12)
N(2)-Cd(2)-O(4E)	90.93(12)	O(7)-Cd(2)-O(4E)	144.56(10)
O(8D)-Cd(2)-O(4E)	87.29(10)	N(3)-Cd(2)-O(3E)	89.98(11)
N(2)-Cd(2)-O(3E)	90.02(12)	O(7)-Cd(2)-O(3E)	89.75(10)
O(8D)-Cd(2)-O(3E)	142.09(10)	O(4E)-Cd(2)-O(3E)	54.81(9)
2			
Cd(1)-O(3)	2.245(4)	Cd(1)-N(1A)	2.296(5)
Cd(1)-O(4A)	2.293(5)	Cd(1)-N(2)	2.306(5)
Cd(1)-O(6)	2.371(4)	Cd(1)-O(5)	2.408(4)
Cd(2)-O(1A)	2.368(3)	Cd(2)-O(7)	2.285(4)
Cd(2)-O(8B)	2.251(4)	Cd(2)-N(3C)	2.301(4)
Cd(2)-N(4D)	2.310(4)	Cd(2)-O(2A)	2.392(4)
O(3)-Cd(1)-N(1A)	90.91(18)	O(3)-Cd(1)-O(4A)	120.04(15)
N(1A)-Cd(1)-O(4A)	90.64(18)	O(3)-Cd(1)-N(2)	88.64(17)
N(1A)-Cd(1)-N(2)	177.39(17)	O(4A)-Cd(1)-N(2)	87.36(17)
O(3)-Cd(1)-O(6)	148.13(15)	N(1A)-Cd(1)-O(6)	89.51(16)
O(4A)-Cd(1)-O(6)	91.82(14)	N(2)-Cd(1)-O(6)	92.23(16)
O(3)-Cd(1)-O(5)	93.18(14)	N(1A)-Cd(1)-O(5)	95.49(16)
O(4A)-Cd(1)-O(5)	146.15(14)	N(2)-Cd(1)-O(5)	87.10(16)
O(6)-Cd(1)-O(5)	55.09(13)	O(8B)-Cd(2)-O(7)	121.47(14)
O(8B)-Cd(2)-N(3C)	90.58(16)	O(7)-Cd(2)-N(3C)	89.39(16)
O(8B)-Cd(2)-N(4D)	88.70(15)	O(7)-Cd(2)-N(4D)	88.46(16)
N(3C)-Cd(2)-N(4D)	176.96(15)	O(8B)-Cd(2)-O(1A)	93.67(13)
O(7)-Cd(2)-O(1A)	144.79(13)	N(3C)-Cd(2)-O(1A)	87.81(15)
N(4D)-Cd(2)-O(1A)	95.18(14)	O(8B)-Cd(2)-O(2A)	149.28(14)
O(7)-Cd(2)-O(2A)	89.22(14)	N(3C)-Cd(2)-O(2A)	91.16(15)
N(4D)-Cd(2)-O(2A)	90.96(15)	O(1A)-Cd(2)-O(2A)	55.77(13)

Symmetry codes: A: -x, -y, 2 - z; B: -2 + x, -1 + y, 1 + z; C: 1 -x, 1 -y, 2 - z; D: 2 -x, 1 -y, 1 - z; E: 1 + x, 1 + y, z for **1**. A: -x, -y, -z; B: -x, -y, -z + 1; C: -1 + x, -1 + y, z; D: 1 - x, 1 - y, 1 - z for **2**.