Supporting Information for

A flexible metal azolate framework with drastic luminescence response toward solvent vapors and carbon dioxide

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Supplementary Index

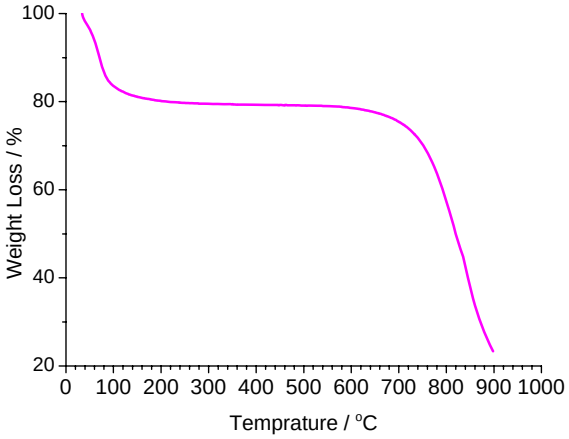

Fig. S1. TGA curve of the as synthesized **1**·g

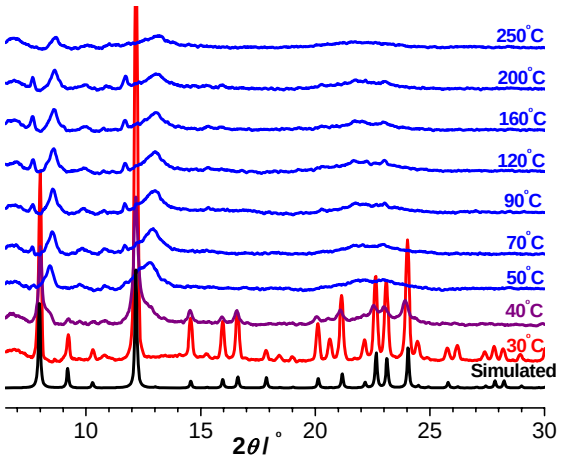

Fig. S2. Variable-temperature PXRD patterns of **1**·g

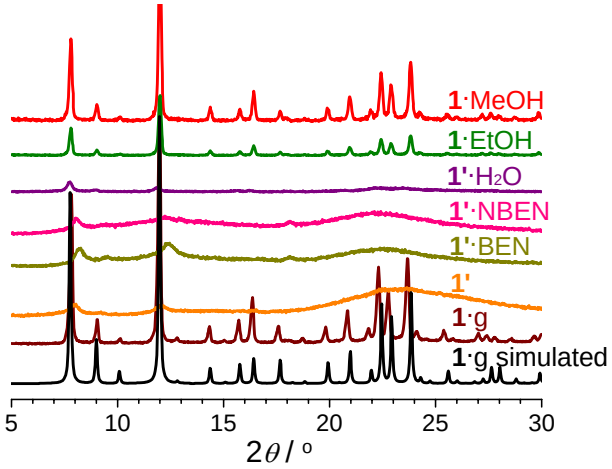

Fig. S3. PXRD patterns of **1**·g, **1'**, **1'**·BEN, **1'**·NBEN, **1'**·H_2O, **1**·EtOH, and **1**·MeOH.

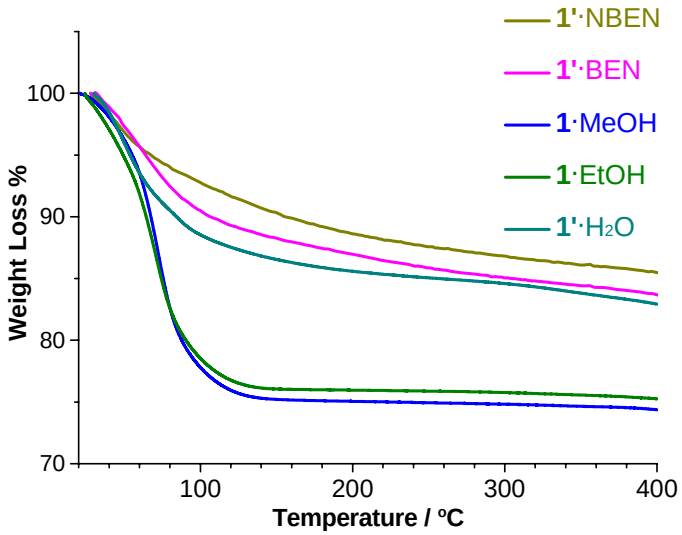

Fig. S4. TGA curve of **1'**·NBEN, **1'**·BEN, **1**·MeOH, **1**·EtOH, and **1'**·H_2O

Table S1 Summary of guest sorption amounts of **1'**

	MeOH	EtOH	H_2O	Ben	Nben
Weight loss	25%	24%	15.5%	15%	13.5%
Formula	**1**·32.5MeOH	**1**·21.4EtOH	**1**·31.8H_2O	**1'**·7.0Ben	**1'**·4.0Nben

[a] **1** and **1'** refers to $Zn_7(ip)_{12}(OH)_2$

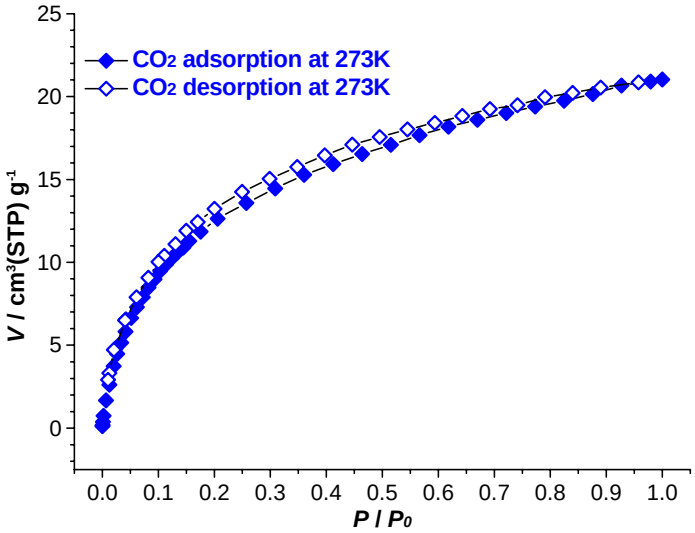

Fig. S5 CO_2 sorption isotherms of **1'** at 273 K

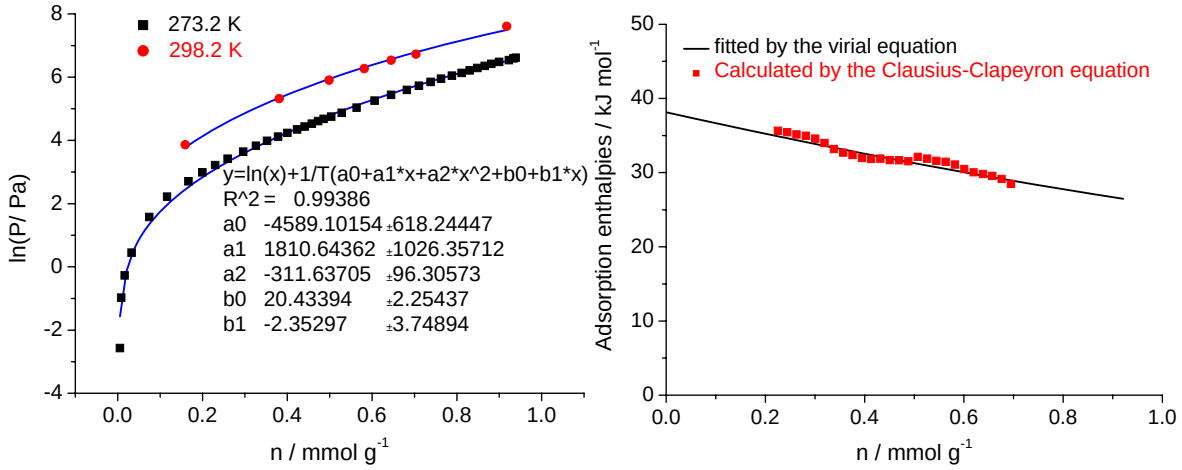

Fig. S6 Adsorption enthalpies of CO_2 fitted by the virial equation from adsorption isotherms measured at 273 and 298 K and calculated by the Clausius-Clapeyron equation.

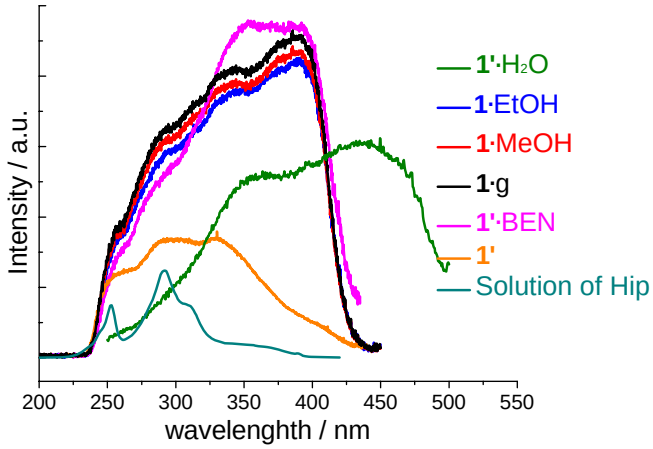

Fig. S7. Photoluminescence excitation spectra of **1**·g, **1'**, **1'**·BEN, **1**·MeOH, **1**·EtOH, **1'**·H_2O, and methanol solution of Hip (10^{-6} M).

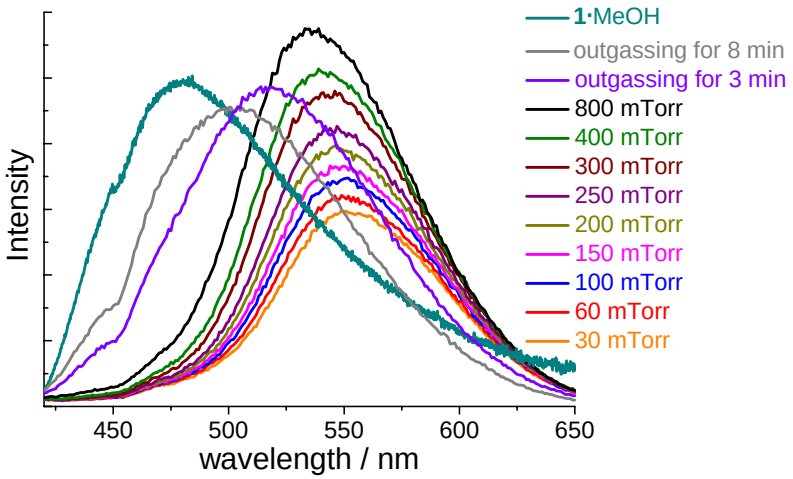

Fig. S8. Photoluminescence emission profiles of **1**·MeOH under dynamic vacuum (at the beginning, pressure above 1000 mTorr cannot be read by the low-pressure sensor). Loading MeOH increases the emission intensity of both the crystalline and quasi-amorphous phases. The phase transition from crystalline to quasi-amorphous also increases the emission intensity, which surpass the effect of MeOH desorption.

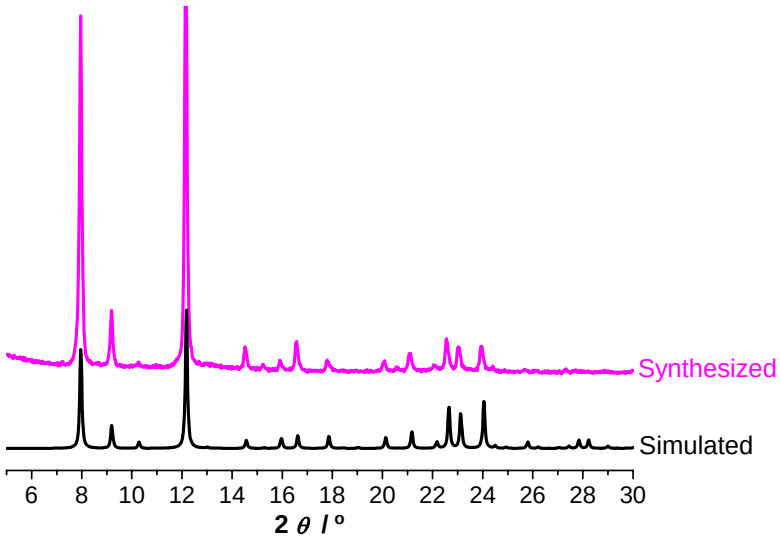

Fig. S9 PXRD patterns of film of **1**·g thin film grown on a zinc plate.

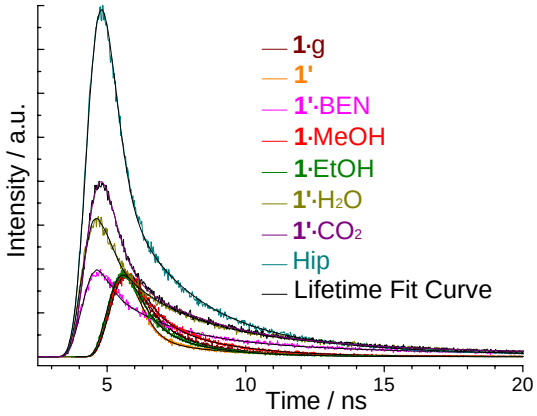

Fig. S10 Luminescence decay profiles of **1, 1', 1**·EtOH**, 1**·MeOH**, 1'**·BEN**, 1'**·H_2O and methanol solution of Hip (10^{-6} M).

Table S2 Fitted lifetimes corresponding to Fig. S11.

	τ_1(ns)	Rel%	τ_2	Rel%	τ_3	Rel%	χ^2	weighted- average lifetime (ns)
1·g	0.84(1)	64.06(1)	2.91(4)	35.94(1)	—	—	1.006	1.58
1'	0.39(1)	69.51(5)	2.1(2)	25.66(1)	5.2(5)	14.83(2)	0.996	1.58
1'·BEN	0.24(3)	9.6(5)	2.47(6)	36.94(3)	10.47(10)	53.44(1)	1.000	6.53
1'·H_2O	0.12(2)	14.(1)	2.14(4)	35.52(2)	8.12(6)	50.64(1)	1.004	4.88
1·MeOH	0.69(2)	37.53(2)	2.52(2)	62.47(2)	—	—	0.998	1.83
1·EtOH	0.54(1)	45.46(3)	1.90(2)	54.54(2)	—	—	1.006	1.28
1'·CO_2	0.37(1)	22.(1)	2.62(6)	36.45(2)	9.1(1)	40.86(1)	0.996	4.79

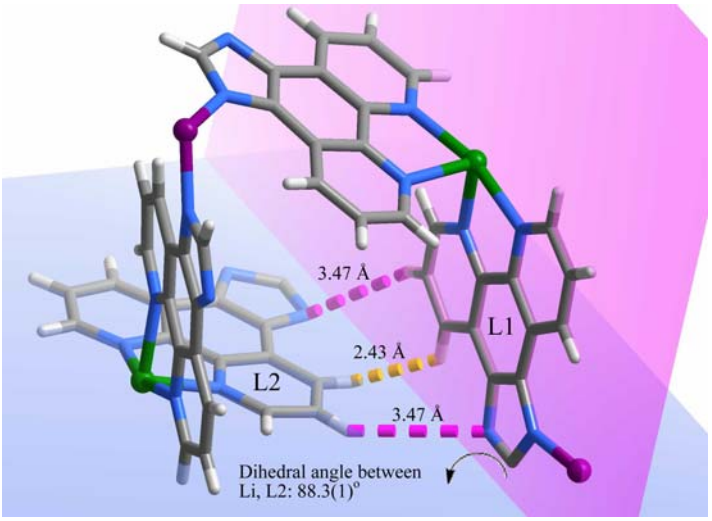

Fig. S11 Perspective view of the contact of adjacent ip$^-$ ligands in **1**·g.