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Supporting Information

Carbon nanodots functional MOFs composites by a stepwise synthetic approach: enhanced H_2 storage and fluorescent sensing

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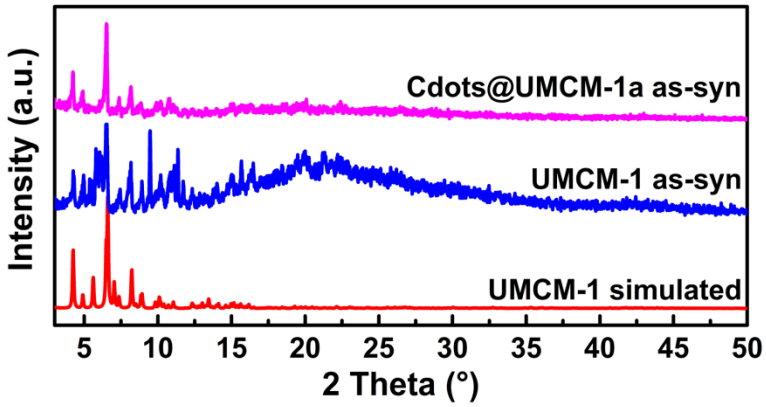

Fig. S1 PXRD patterns of Cdots@UMCM-1a, as-synthesized UMCM-1, and simulated UMCM-1.

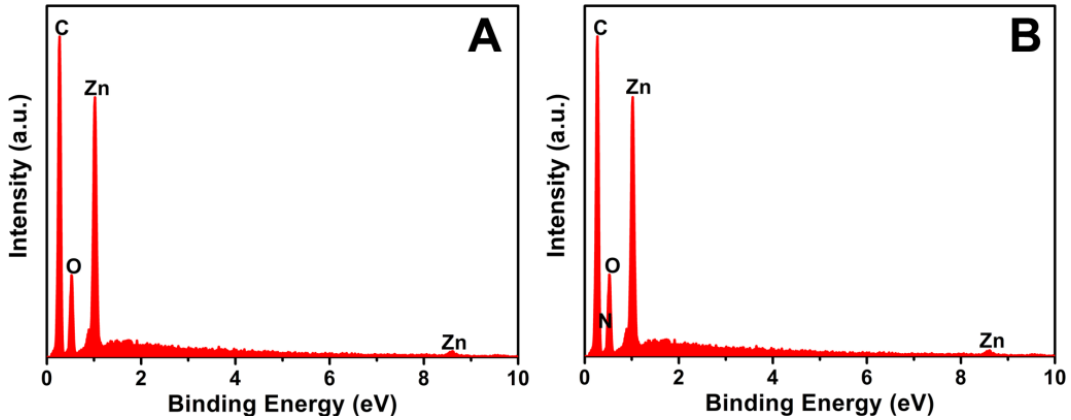

Fig. S2 EDS of (A) UMCM-1 and (B) Cdots@UMCM-1a.

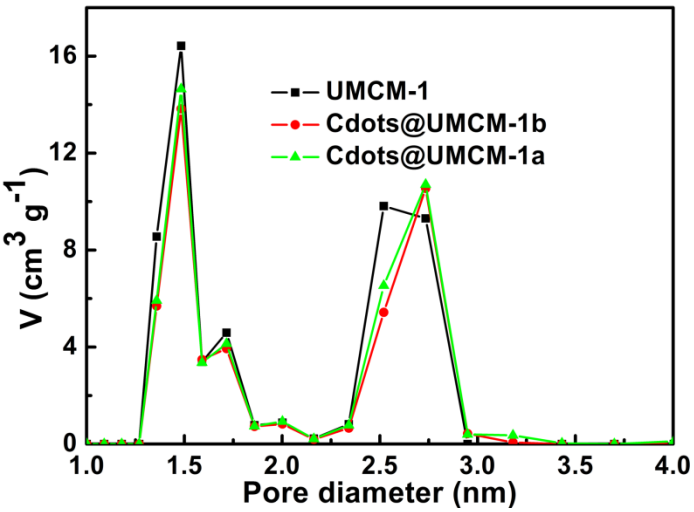

Fig. S3 Pore size distributions of UMCM-1, Cdots@UMCM-1a, and Cdots@UMCM-1b, respectively.

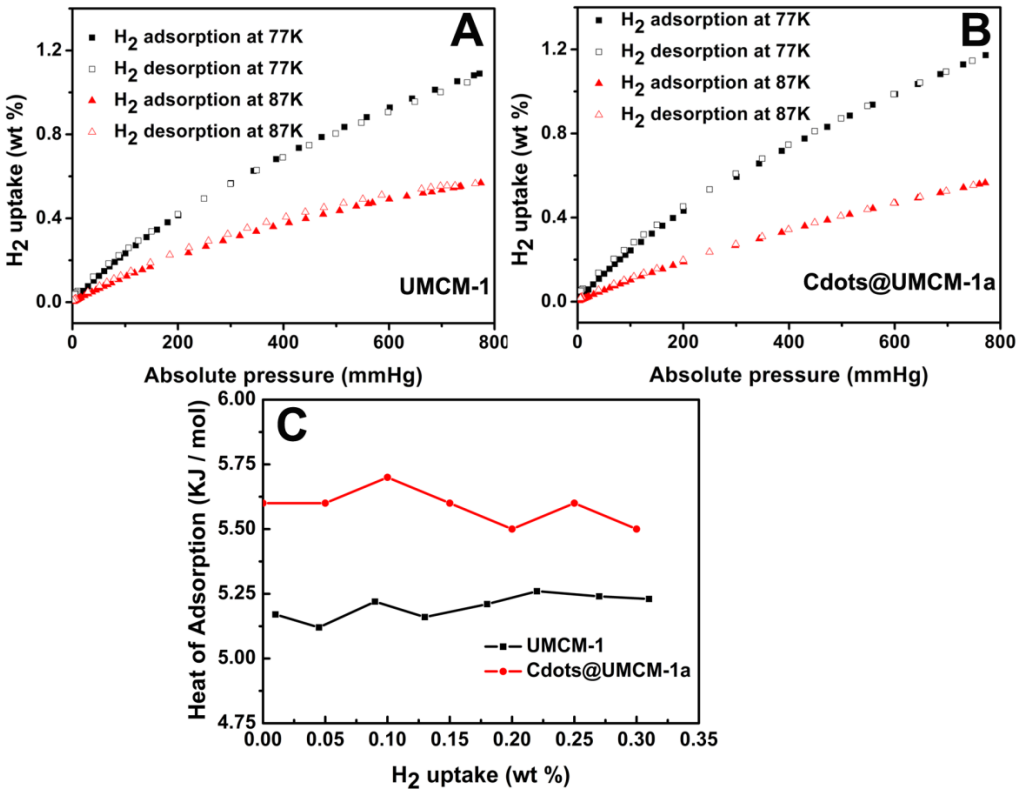

Fig. S4 (A) and (B) H_2 storage for UMCM-1 and Cdots@UMCM-1a at ambient pressure (using the isotherms at 77 K and 87 K). (C) Isosteric heat of adsorption for H_2 on UMCM-1 and Cdots@UMCM-1a (using the isotherms at 77 K and 87 K).

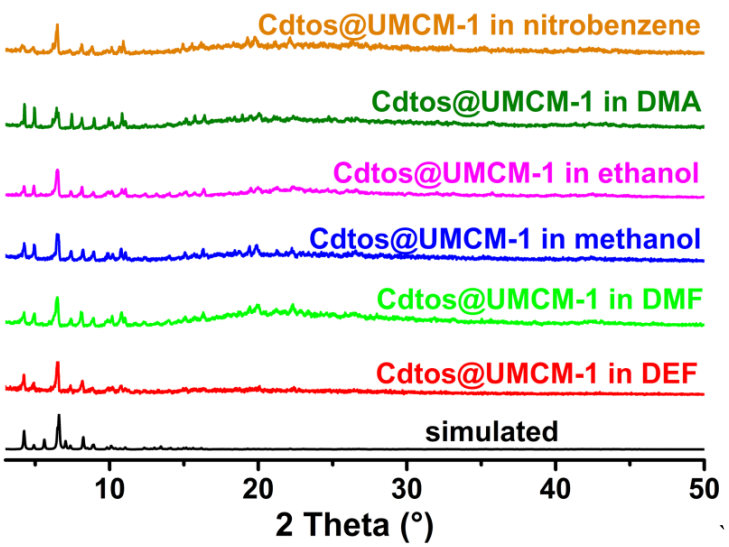

Fig. S5 PXRD patterns of Cdots@UMCM-1a in different solvents.

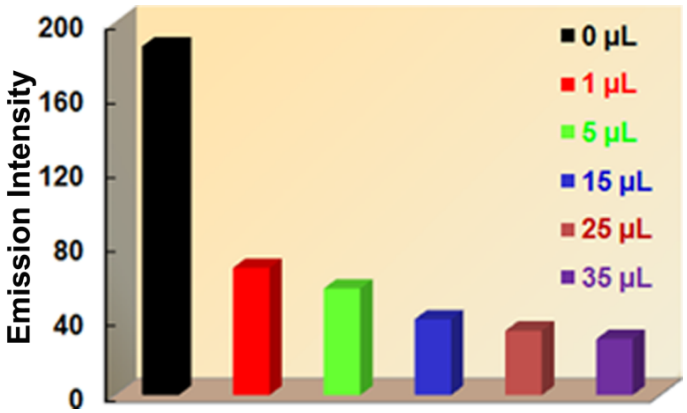

Fig. S6 The emission intensities of Cdots@UMCM-1a in DEF solution with different amount of NB (excited at 420 nm).

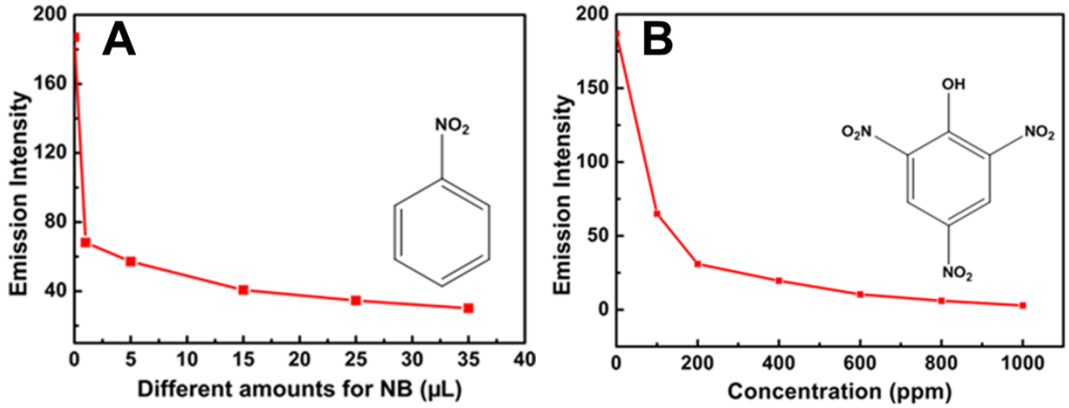

Fig. S7 The relationship between emission intensity and different amounts for (A) NB, and (B) TNP in DEF solution of Cdots@UMCM-1a, respectively.

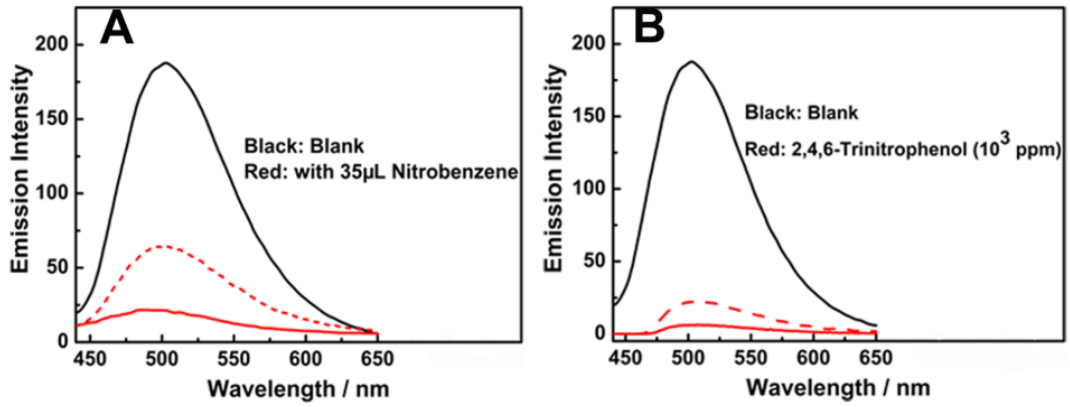

Fig. S8 FL spectra of Cdots@UMCM-1a (solid line) and Cdots (dash line) in DEF solution with 0 μL and 35 μL (A) NB or 0 ppm and 1000 ppm (B) TNP, respectively.

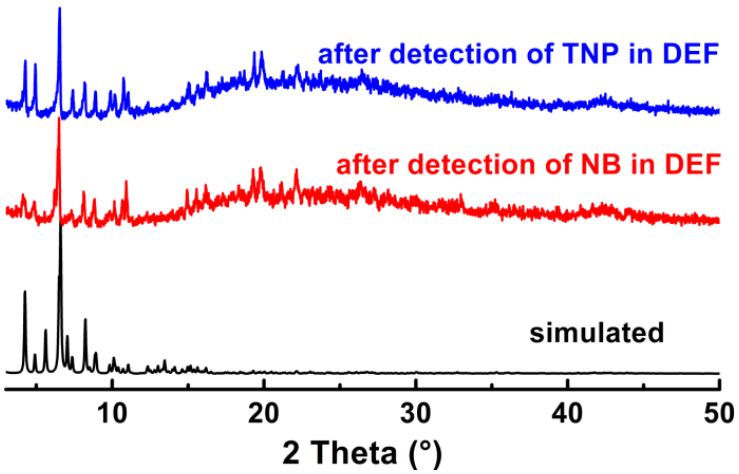

Fig. S9 PXRD patterns of Cdots@UMCM-1a after detection of NB or TNP in DEF.

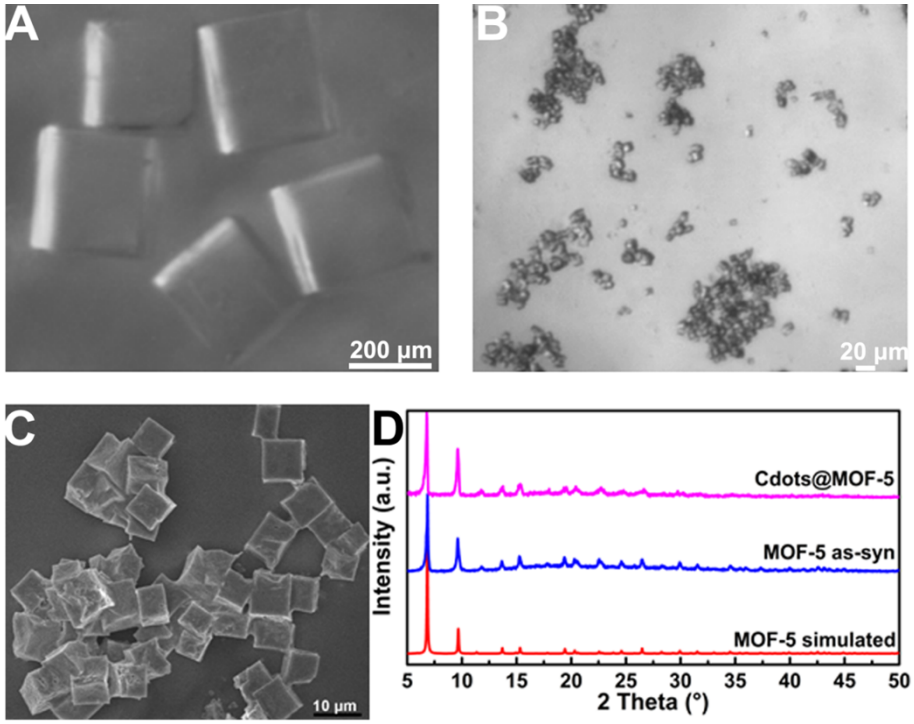

Fig. S10 Optical micrographs of (A) MOF-5 and (B) Cdot@MOF-5. (C) SEM image of Cdots@MOF-5. (D) PXRD patterns of MOF-5 simulated, MOF-5 as-syn and Cdots@MOF-5 as-syn, respectively.

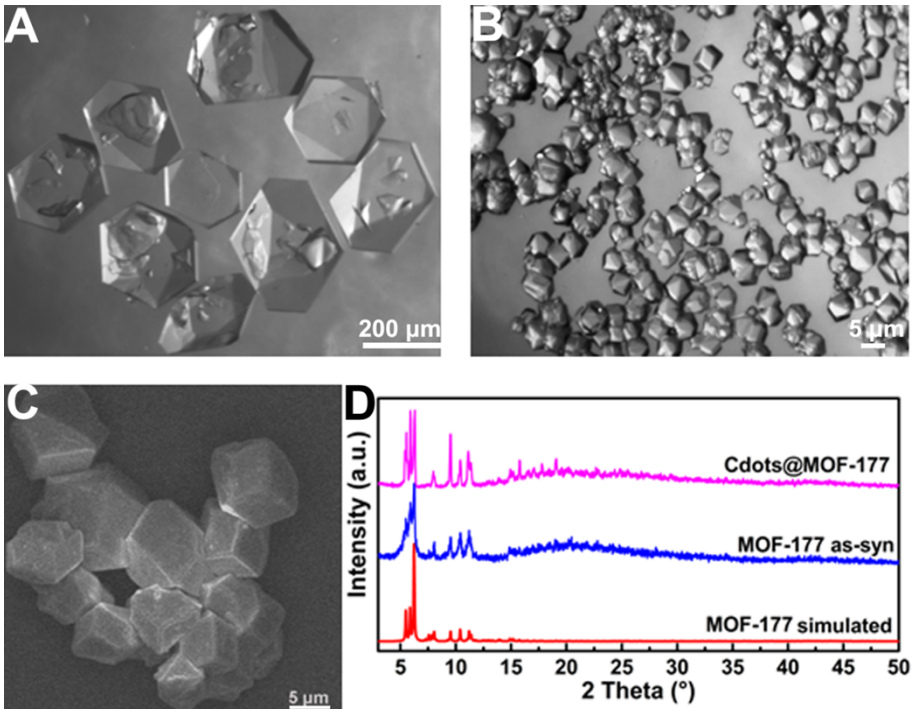

Fig. S11 Optical micrographs of (A) MOF-177 and (B) Cdot@MOF-177. (C) SEM image of Cdots@MOF-177. (D) PXRD patterns of MOF-177 simulated, MOF-177 as-syn and Cdots@MOF-177 as-syn, respectively.

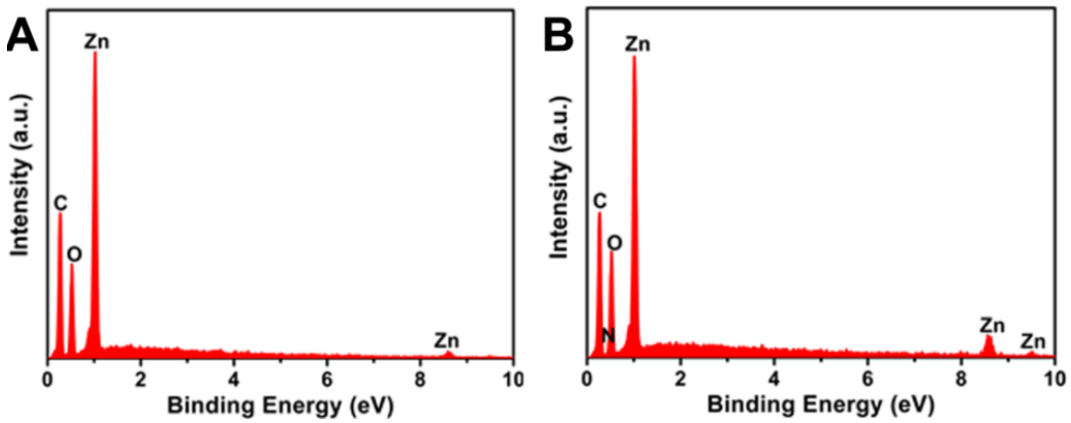

Fig. S12 EDS of (A) MOF-5 and (B) Cdots@MOF-5, respectively.

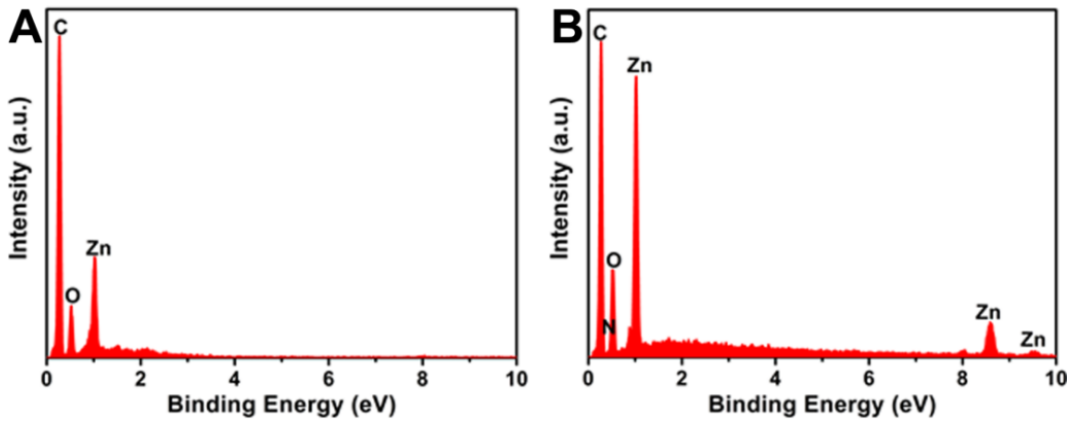

Fig. S13 EDS of (A) MOF-177 and (B) Cdots@MOF-177, respectively.

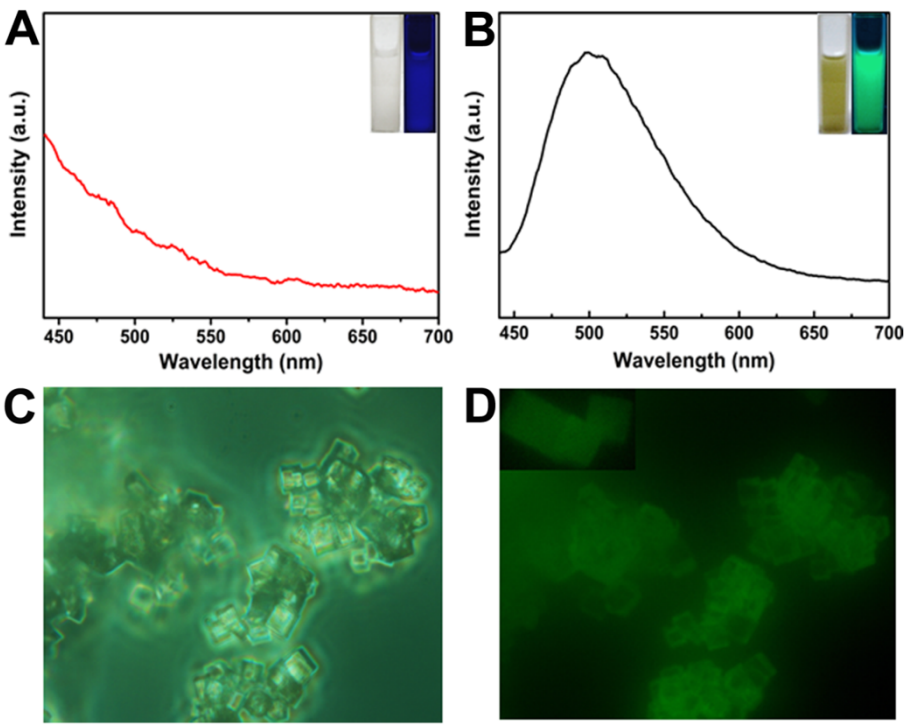

Fig. S14 PL spectra of (A) MOF-5, and (B) Cdots@MOF-5 with excitation wavelength at 420 nm (insets: photographs of corresponding samples without (left) and with (right) UV light (365 nm)). (C) and (D) CLSM images of Cdots@MOF-5.

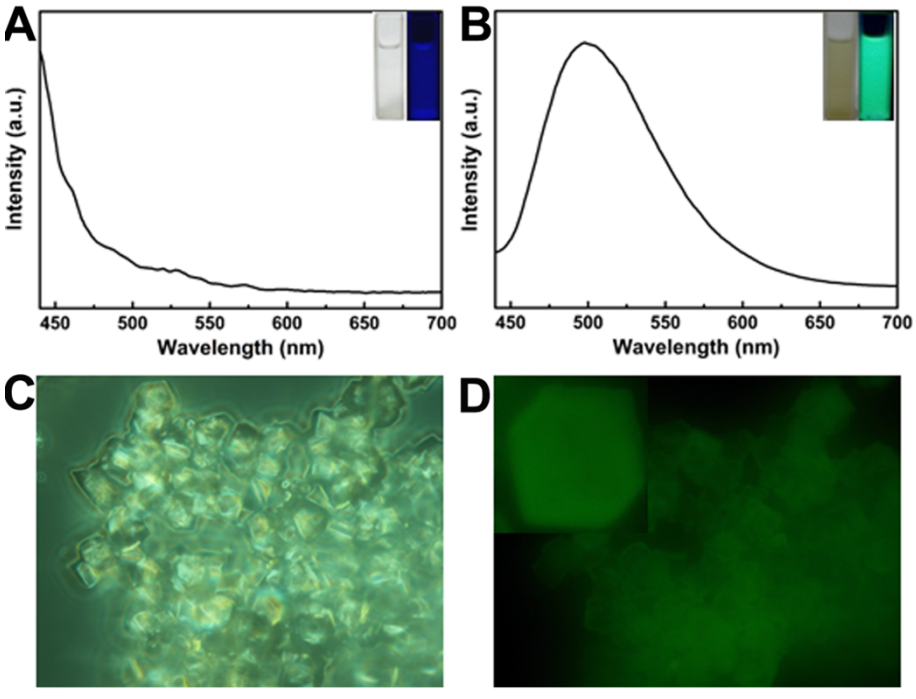

Fig. S15 PL spectra of (A) MOF-177, and (B) Cdots@MOF-177 with excitation wavelength at 420 nm (insets: photographs of corresponding samples without (left) and with (right) UV light (365 nm)). (C) and (D) CLSM images of Cdots@MOF-177.

Table S1. Textural properties and H_2 storage capacities of UMCM-1, Cdots@UMCM-1a, and Cdots@UMCM-1b, respectively.

Materials	Surface area	Total pore volume	Micropore volume	Mesopore volume	H_2 uptake
	(m^2 g^{-1})	(cm^3 g^{-1})	(cm^3 g^{-1})	(cm^3 g^{-1})	(wt %)
UMCM-1	4150[a]/6669[b]	2.14	0.88	1.26	1.11
Cdots@UMCM-1b	3435[a]/5512[b]	1.79	0.68	1.11	1.22
Cdots@UMCM-1a	3714[a]/5928[b]	1.95	0.71	1.24	1.21

a The surface area is estimated by applying the BET equations.

b The surface area is estimated by applying the Langmuir equations.