Supporting Information

Metal-organic frameworks with inherent recognition sites for selective phosphate sensing through their coordination-induced fluorescence enhancement effect

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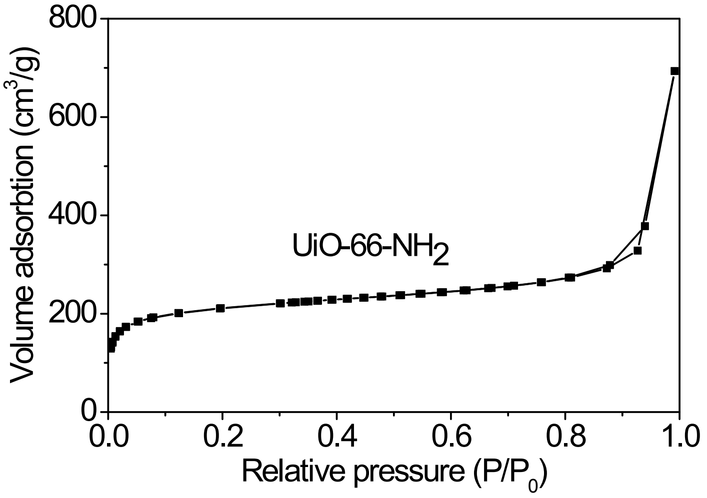
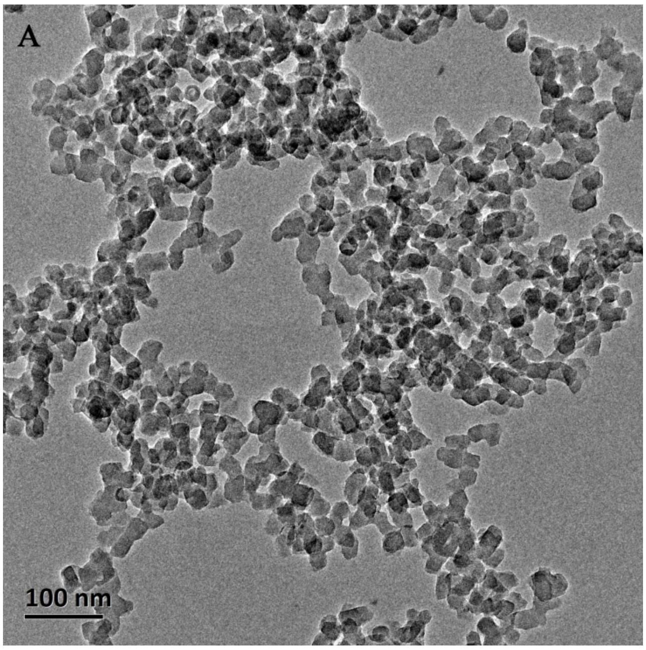


Fig. S1 N_2 adsorption-desorption isotherms of the as-synthesized UiO-66-NH$_2$ nanoparticles.



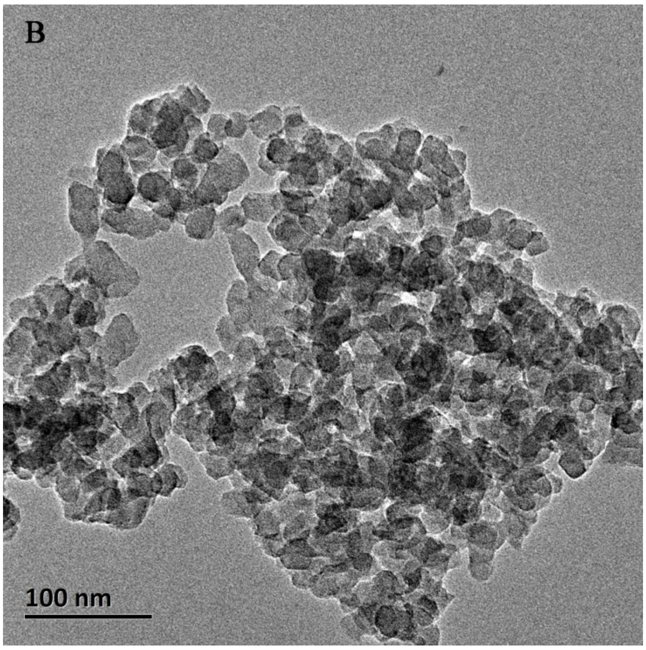


Fig. S2 TEM images of (A) UiO-66-NH_2 and (B) UiO-66-NH_2 (P). UiO-66-NH_2 (P) was the collected powder sample after contacting UiO-66-NH_2 with phosphate (P : Zr molar ratio was 0.6:1 in the solution) for 90 min.

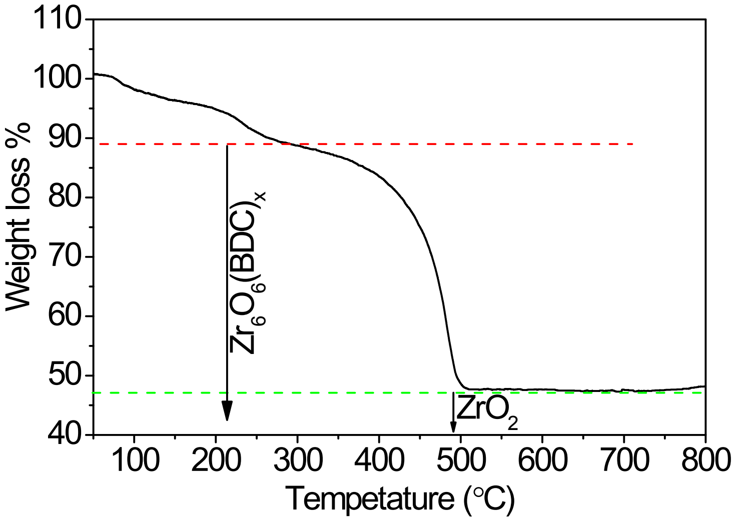


Fig. S3 TGA profile for the as-synthesized UiO-66-NH_2 recorded under air flow.

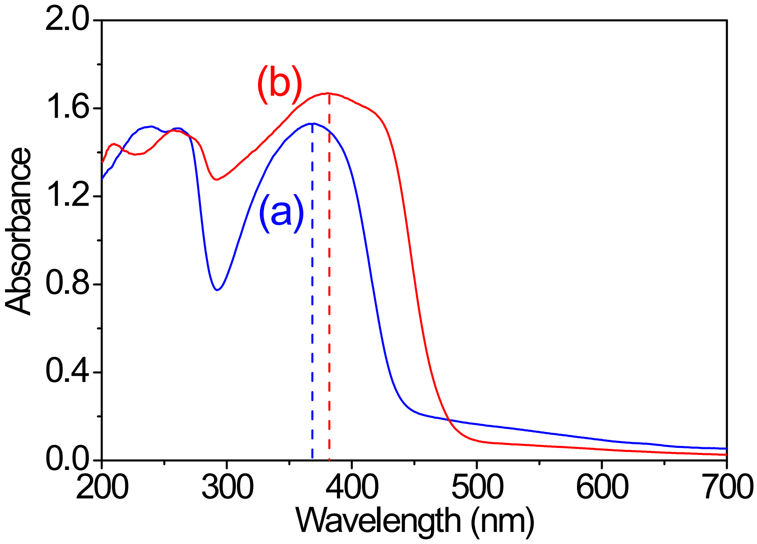


Fig. S4 The DR-UV-Vis spectra of UiO-66-NH_2 (a, blue) and BDC-NH_2 ligand (b, red) at room temperture.

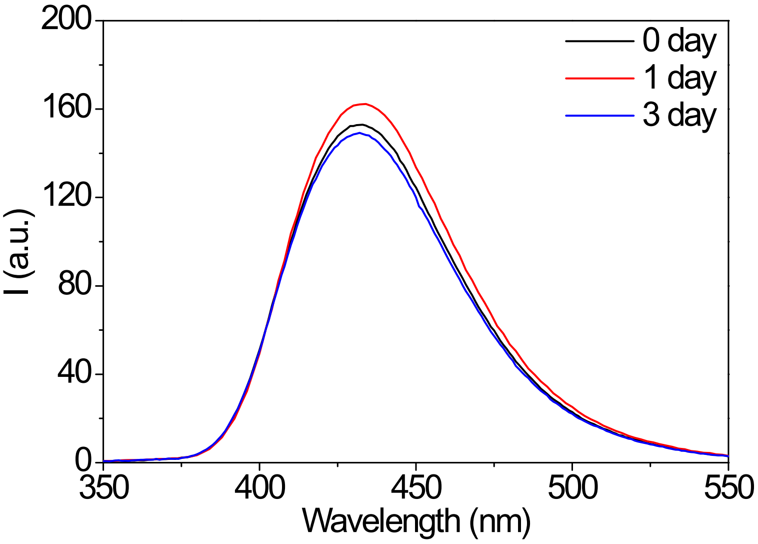


Fig. S5 The evolvement of the fluorescent emmision from UiO-66-NH_2 suspension with a time duration of 0 (Black), 1 (Red) and 3 (Blue) days. The Fluorescence stability measurement was conducted in HEPES solution (pH = 7, 20 mmol) with UiO-66-NH_2 concentration of 50 mg L^{-1}. **To make the curves more clearly, here we used the wider slit for fluorescence measurement than that used in Fig. 2.**

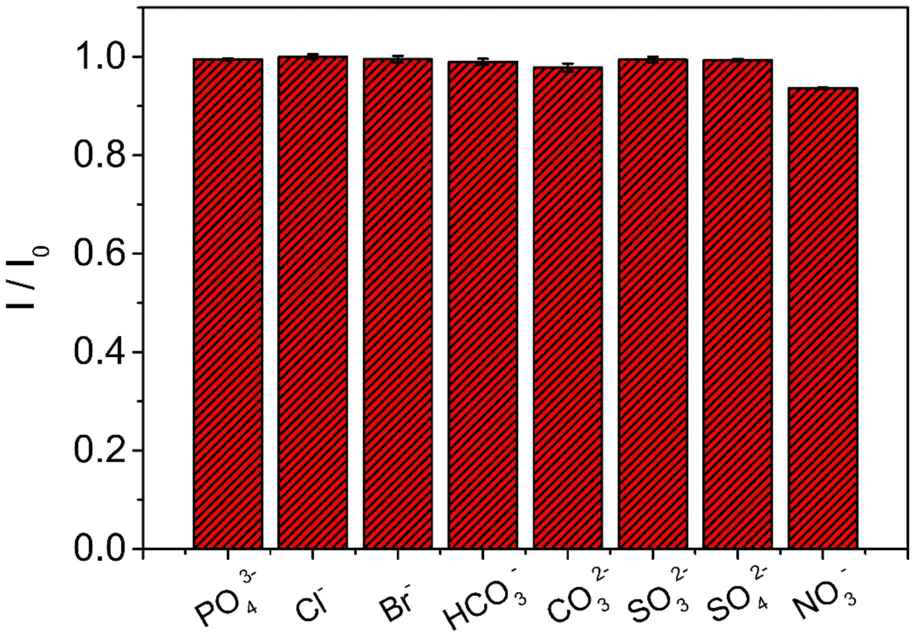
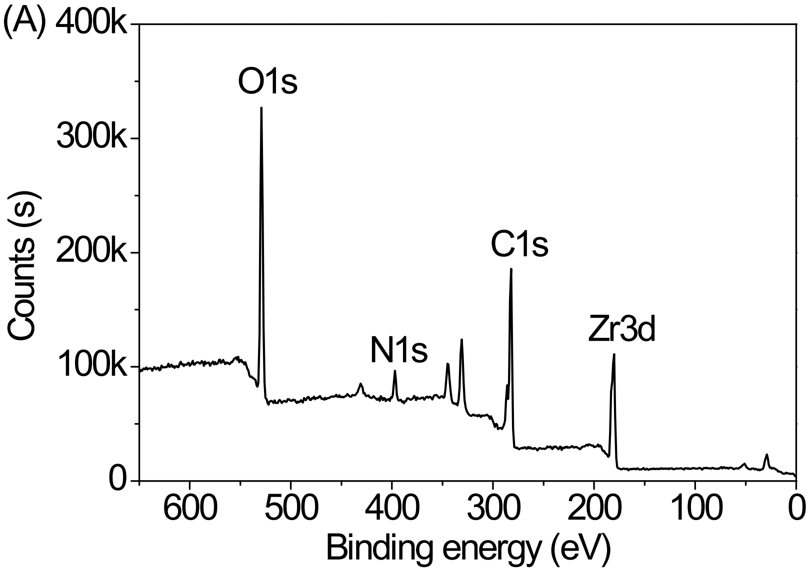


Fig. S6 Fluorescence response of BDC-NH_2 ligand towards different anions (100 μM for each). I_0 and I denote the fluorescence intensity of BDC-NH_2 in HEPES buffer solution without and with anions, respectively.



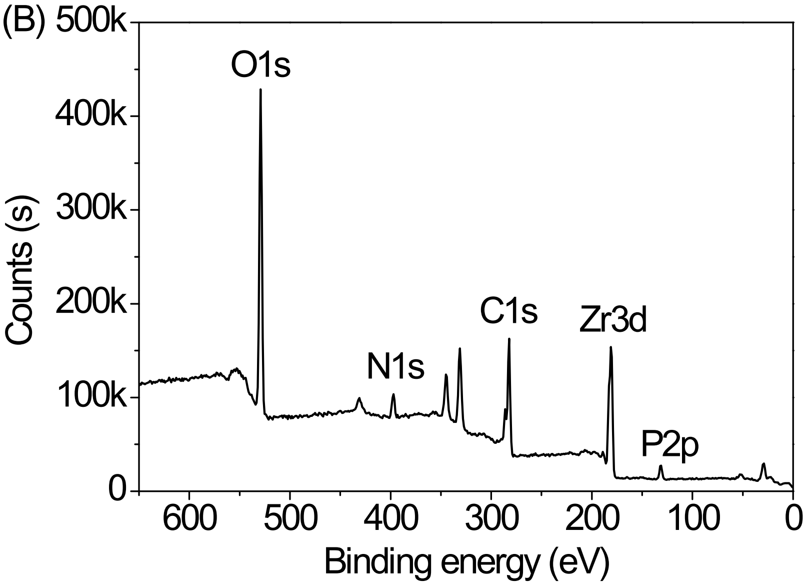


Fig. S7 Wide scan XPS spectra of A) UiO-66-NH_2 and B) UiO-66-NH_2(P).

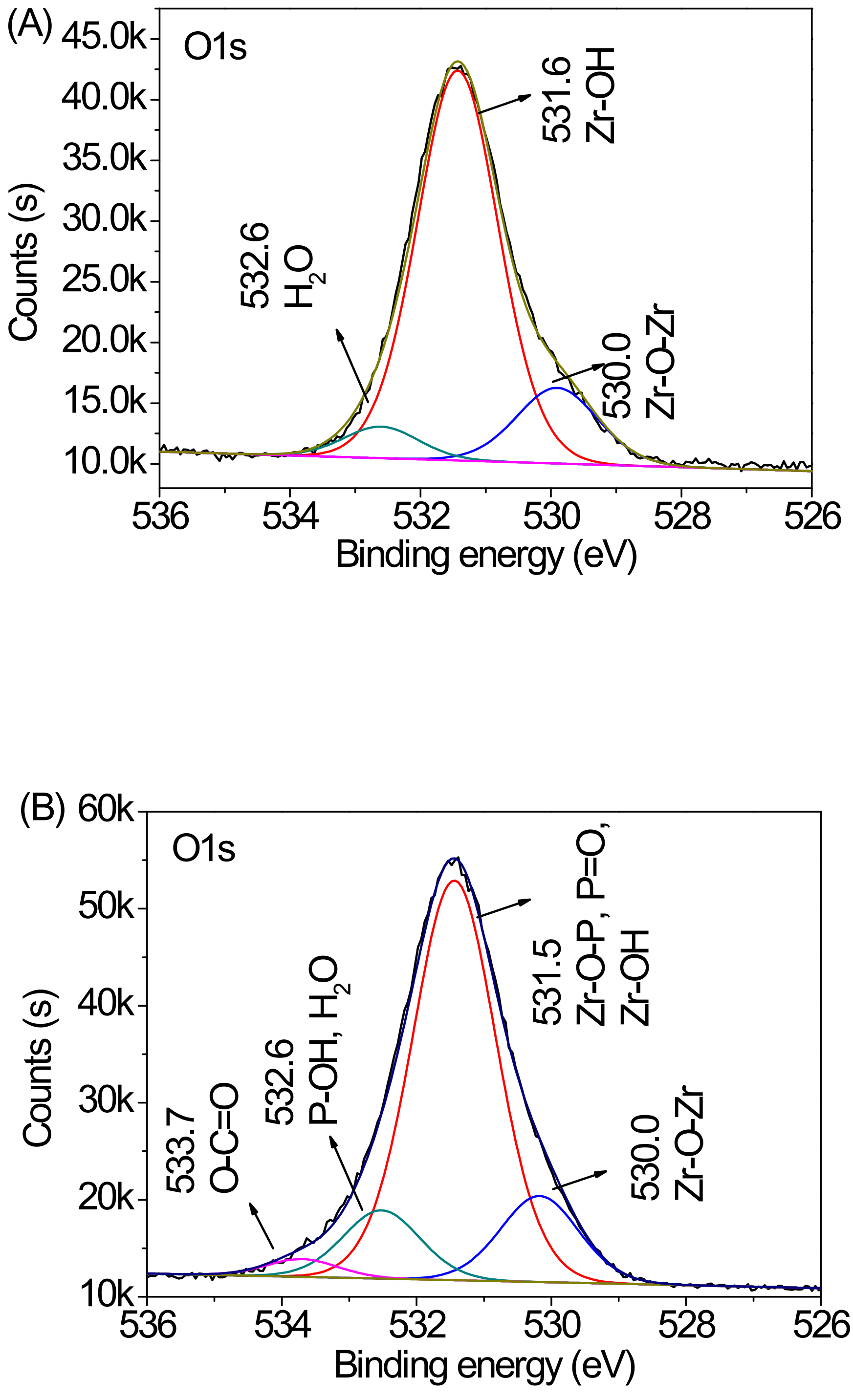


Fig. S8 The magnified O1s XPS spectra of the (A) UiO-66-NH_2 and (B) UiO-66-NH_2(P).

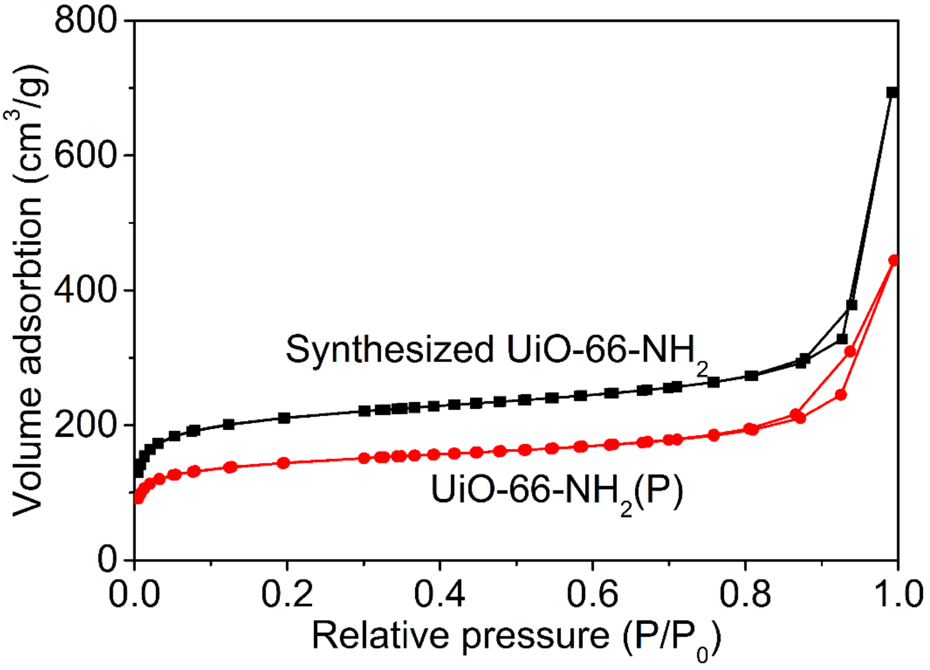


Fig. S9 N_2 sorption isotherms of UiO-66-NH_2 (Black) and UiO-66-NH_2(P) (Red). UiO-66-NH_2 (P) was the collected powder samples after contacting UiO-66-NH_2 with phosphate (P : Zr molar ratio was set as 0.6:1 in the solution) for 90 min.