Supporting Information

Metal-Organic Framework Nanosheets: from Nano-Scale to Micron-Scale with Tunable Color

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Experimental Section

Materials. All syntheses were performed under ambient conditions and all of the chemicals were of analytical grade and used without further purification.

Characterization. The phase of 3D precursors Ni-Phen obtained under different pH were confirmed by X-ray powder diffractions (PXRD) on an Ultima IV diffractometer equipped with Cu Kα radiation (λ = 1.5418 Å) in the range 5-50°at room temperature. The morphologies of Ni-Phen was characterized by scanning electron microscopy (FE-SEM, HITACHI S-4800 20 kV). The composition of Ni-Phen were characterized by Infrared spectroscopy and Raman spectroscopy. UV−vis absorption of 2D nanosheets was recorded with a Shimadzu UV-3150 double-beam spectrophotometer, in which the absorbance of bacterial growth solution at 500 nm was also measured. The prepared complexes were separately dispersed in solutions with the same concentration, and excitation spectra were first monitored to obtain the optimal excitation peaks. Moreover, the fluorescence emission spectra were determined with the corresponding optimal excitation peak. In addition, the fluorescence spectrum of 2D nanosheets (pH=3, 5, 9, 7, 11) were measured in a similar method and the variation of fluorescent intensity obtained under different irradiation time.

Synthesis of 3D Precursors Ni-Phen at different pH: To a 30mL aqueous solution containing 4g $NiCl_2.6H_2O$, 40 mL aqueous solution containing 3.6g sodium pyromellitic acid was added under stirring, then, a 10 mL methanol

solution containing 0.8g o-phenanthroline was added, the resulting mixtures were stirred under ambient conditions for three hours. After that, the obtained solution was divided into five equal parts, the solution pH of them were adjusted to be 3, 5, 7, 9 and 11 with hydrochloric acid and sodium hydroxide. And then the solution was stirred for 0.5 h, respectively. The products of Ni-Phen were then precipitated, collected by filtration, followed by wash and dry, with yield of about 80 %.

Preparation of 2D Nanosheets: 50mg of the above-obtained Ni-Phen was dispersed in 50ml water. The obtained mixtures were then sonicated in an ultrasonic bath (Brandson, CPX2800H-E, 110 W, 40 KHz) for 8 h. After that, the colloidal suspension was let standing for one week. The upper colloidal suspension of the exfoliated 2D nanosheets was collected by centrifugation to remove the sedimentation of bulk precursors. The powdered samples of 2D nanosheets were obtained by rotary evaporation of the colloidal suspension under room temperature.

Loading of UCNPs: To a 20mL aqueous colloidal suspension of the above-obtained 2D nanosheets, 2 mL aqueous colloid suspension of UCNPs (0.5 mg/mL) was added, and the obtained mixtures were stirred overnight to get the ideal load.
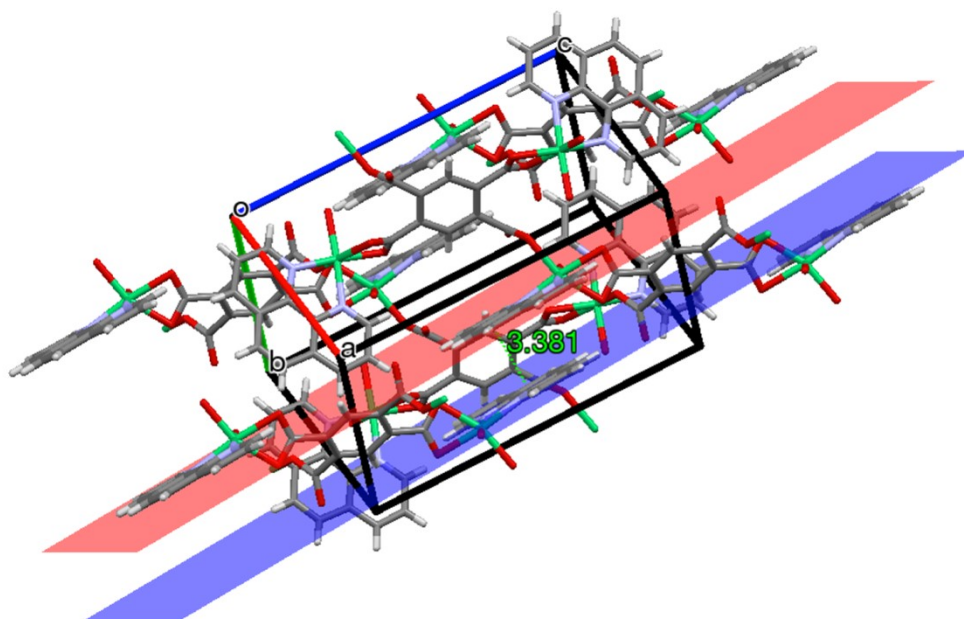
Figure S1. In the unit cell of Ni-Phen, the plane…plane distances between Phen groups in adjacent layers have been highlighted.
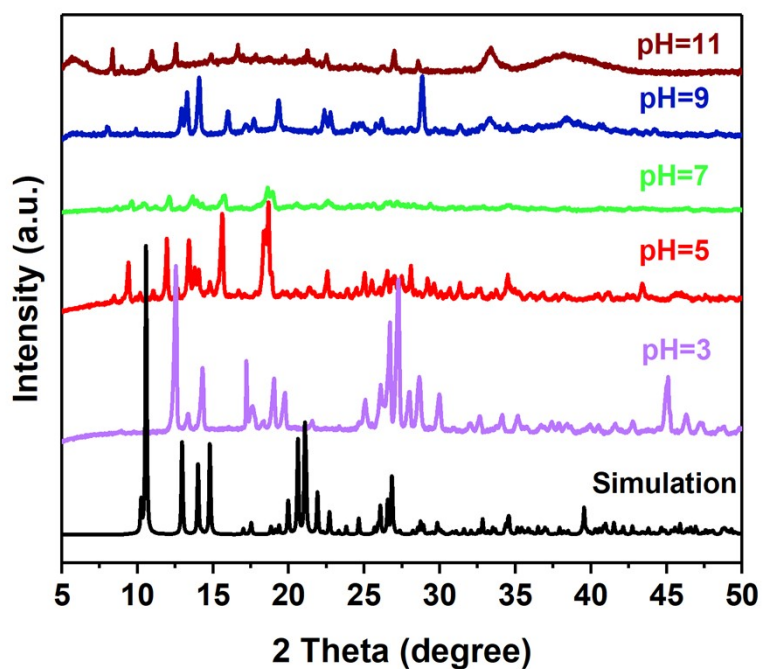

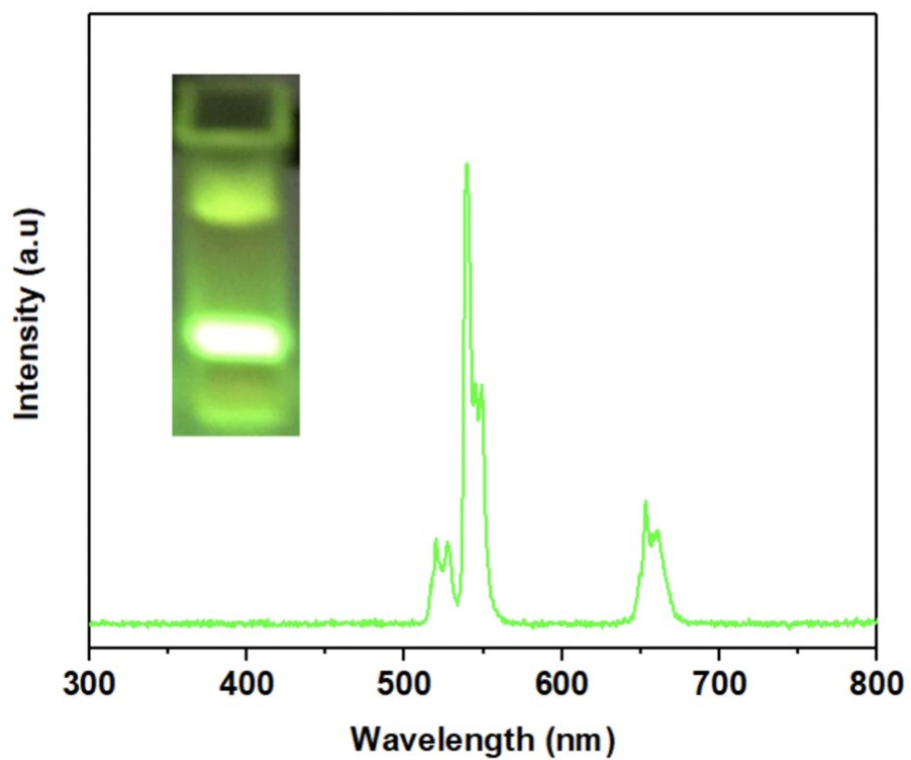**Figure S2.** PXRD pattern of 3D precursors obtained under different pH.

Figure S3. Up-converting green emission from the UCNPs, inset was the corresponding photograph.