Electronic Supplementary Material (ESI) for ChemComm.

Supporting information

Two-dimensional optical waveguiding and luminescence vapochromic properties of 8-hydroxyquinoline zinc (Znq_2) hexagonal microsheets

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1. Materials.

Methanol (CH_3OH, HPLC grade) and Dimethylsulfoxide (DMSO, A.R.) were purchased from the Sinepharm Chemical Reagent Co., Ltd. Bis(8-quinolinolato)zinc(Ⅱ)hydrate(Znq_2) was obtained from TOKYO Chemical industry Co., Ltd and without further purification.Ultrapure water with a resistvity of 18.2 $M\Omega.cm^{-1}$, produced by using a Milli-Q apparatus(Millipore), were used in all experiments.

2. Synthesis of colloidal Znq_2 hexagonal microsheets

In a typical preparation process for Znq_2 nanosheet, 1mL Methanol was rapidly mixed with a stock solution (3mL) containing Znq_2 (0.018g, 5×10^{-5} mol) in Dimthylsulfoxide (DMSO) under shaking. After that, 1mL poor solvent deionized water was rapidly injected into the preprepared solution under shaking. After injection, the colour turned yellow to cream-coloured with obvious Mie scattering[1]. Finally, the precipitates were centrifngally seperated from the colloial suspensionad without further punification.

3. Characterization

The morphologies and sizes of the samples were examined using field-emission scanning electron microscopy (FESEM, FEI Quanta 200F) at acceleration voltages of 15 kV. Prior to analysis, the samples were coated with a thin gold layer using an Edwards Sputter Coater. TEM images were obtained using a Philips CM 200 electron microscope operated at 80 kV. One drop of the as-prepared colloidal dispersion was deposited on a carbon-coated copper grid, and dried under high vacuum. The X-ray diffraction (XRD) patterns were measured by a D/max 2400 X-ray diffractometer with Cu Kα radiation (λ=1.54050 Å) operated in the 2θ range from 3 to 30°, by using the samples filtered on the surface of a quartz substrate. The photoluminescence (PL) and excitation spectra of the samples were measured on a HORIBA OBTN YVON FLUOROMAX-4 spectrofluorimeter with a wavelength resolution of 1 nm. The samples were both deposited on the surface of a quartz substrate. The fluorescence microscopy images were obtained using a Leica DMRBE fluorescence microscopy with a spot-enhanced charge couple device (CCD, Diagnostic Instrument, Inc.). The samples were prepared by placing a drop of dispersion onto a cleaned quartz slide. Laser confocal

fluorescent microscopy (Leica, TCS-SP5) equipped with near ultraviolet and blue laser (405 and 458 nm) was used for fluorescent images.

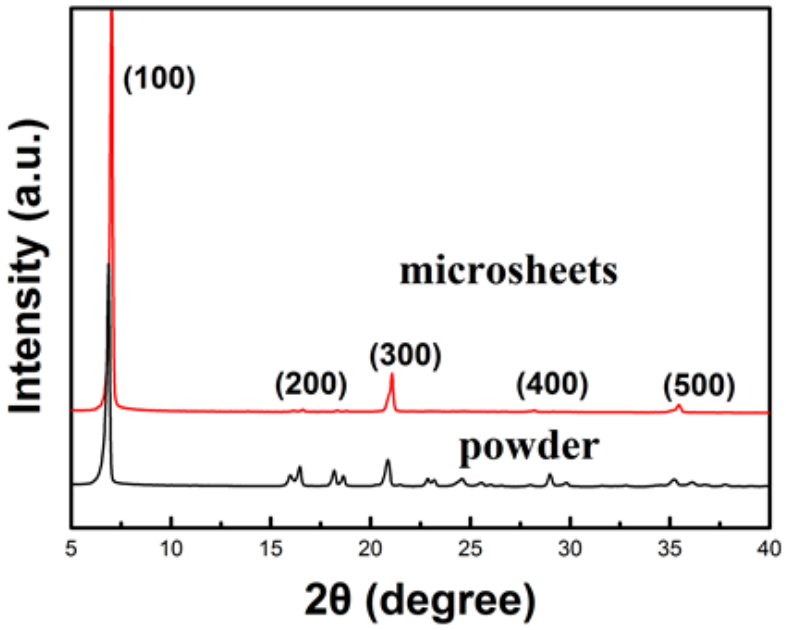

Figure S1. XRD patterns of Znq_2 microsheets and powder.

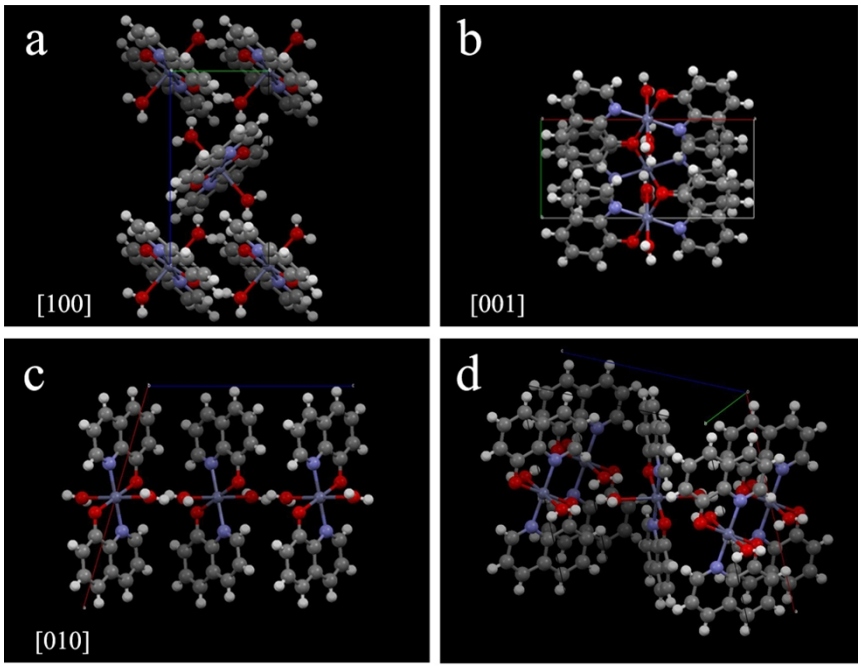

Figure S2. (a) The view of the unit cell of Znq_2 crystal along a axis,i.e., (100) direction. (b) The view of the unit cell along c axis,i.e., (001)

direction. (c) The viewof the unit cell along b axis,i.e., (010) direction. (d) The view of the unit cell at other angle.

Table S3 Calculated total facet areas of different crystal faces of Znq_2

hkl	d_{hkl}/Å	Distance	*% Total facet area*
(100)	12.44	8.04	50.66
(011)	4.95	20.20	14.85
(102)	5.63	17.75	13.20
(110)	5.06	18.24	8.11
(002)	5.48	32.97	7.44

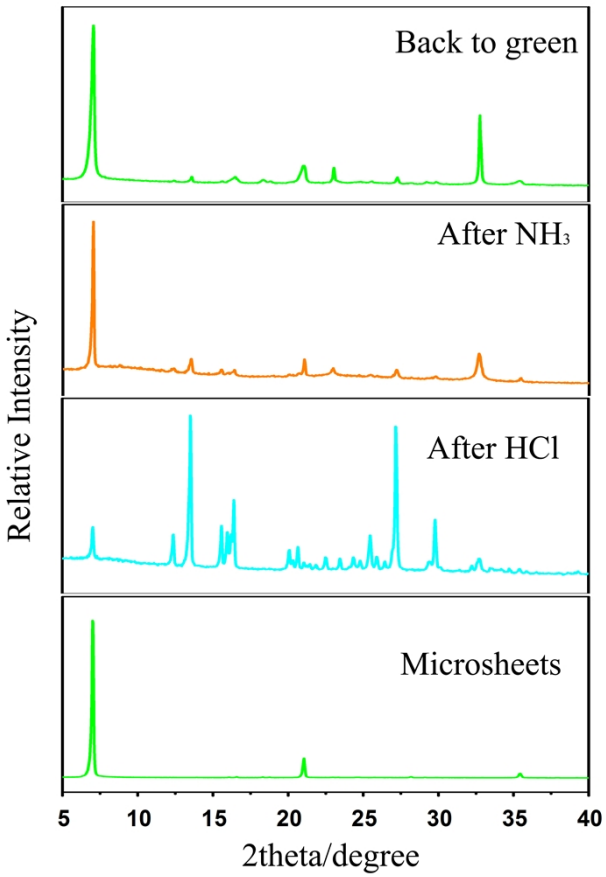

Figure S4. XRD patterns of Znq_2 microsheets, and upon exposure to HCl vapor (blue), NH3 vapor（yellow）and back to green color (green)

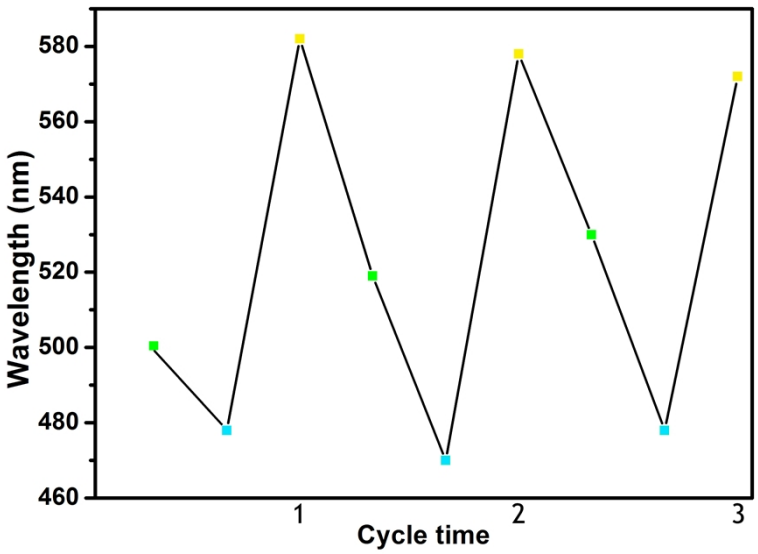

Figure S5. Emission wavelength of the repeated vapochromic behavior of Znq_2 microsheets

References

1. H. Lindner; G. Fritz; O. Glatter, Journal of Colloid and Interface Science., 2001, 247, 239.