Electronic Supplementary Material (ESI) for Journal of Materials Chemistry C.

Supporting Information

Self-assembly of LaF_3:Yb,Er/Tm Nanoplates into Colloidal Spheres and Tailoring Their Upconversion Emissions with Fluorescent Dyes

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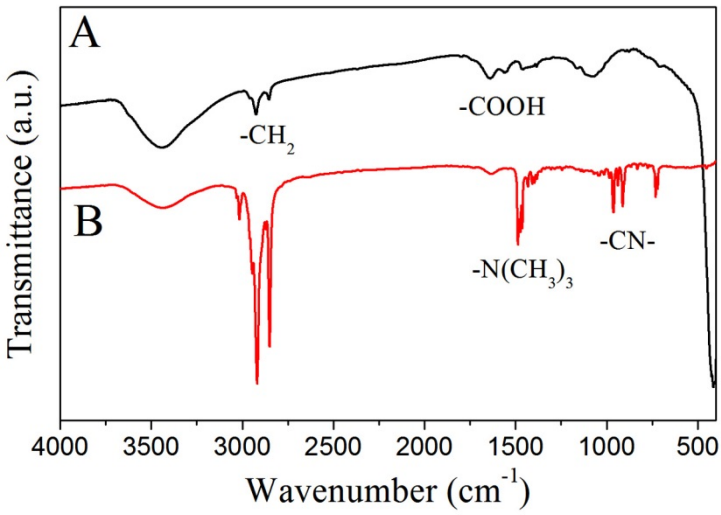

Fig. S1. FTIR spectra of (A) the LaF_3 nanoplates and (B) assembled LaF_3 nanoplates with CTAB, namely, the LaF_3 CNCs. Due to the attached OA molecules on surface, stretching peaks of $-CH_2$ and –COOH can be easily detected on the LaF_3 nanoplates. After these nanoplates were assembled into colloidal spheres with CTAB, stretching peaks from $-N(CH_3)_3$ and C-N can also be detected in addition to the peaks from OA molecules. This result clearly shows that many CTAB molecules have been adsorbed on the surface of LaF_3 CNCs after assembly.

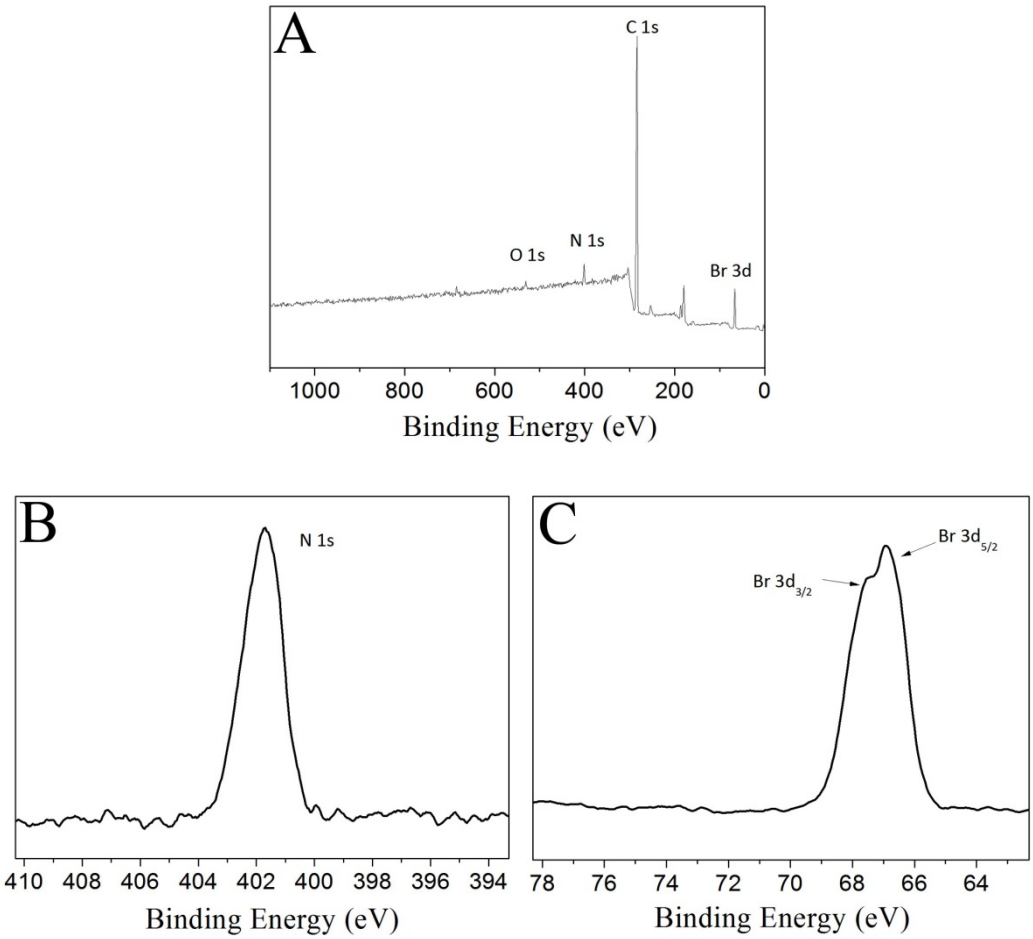

Fig. S2. X-ray photoelectron spectroscopy (XPS) analyses of element N and Br in the LaF_3 CNCs: (A) whole spectrum; (B) N 1s; (C) Br 3d. In the synthetic system of LaF_3 CNCs, only CTAB molecules have element N and Br. The XPS data further confirm that some CTAB molecules have been adsorbed on the colloidal spheres.

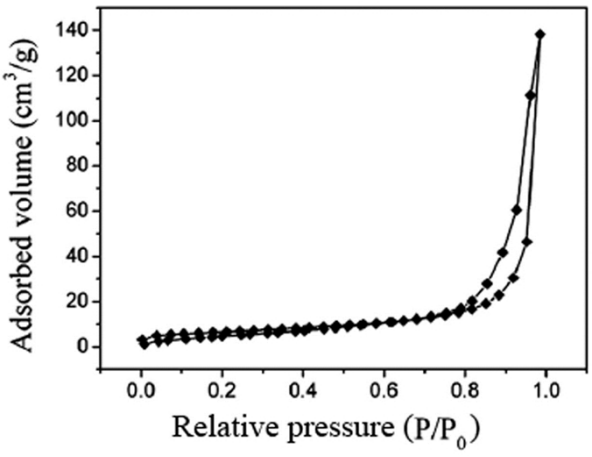

Fig. S3. N_2 adsorption-desorption isotherms of the LaF_3 CNCs. This data can be clearly indexed to a typical type-IV isotherm according to the International Union of Pure and Applied Chemistry (IUPAC) nomenclature, confirming the existence of mesoporous pores inside these CNCs.

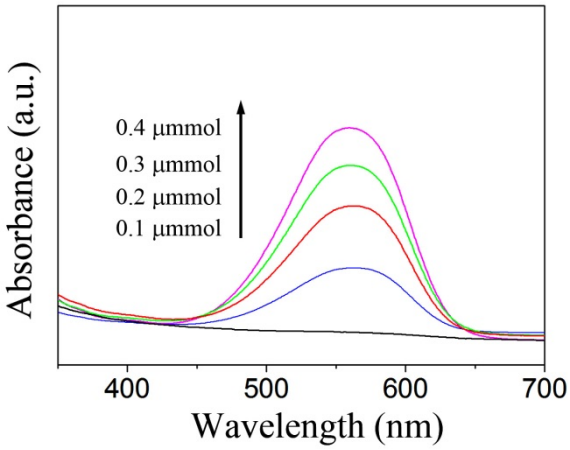

Fig. S4. UV-Vis spectra of the LaF_3:Yb,Er CNCs loaded with different amount of Nile red. The loading concentration of dyes can be measured by UV-Vis spectroscopy and the loading amount of dyes can be reproducibly controlled.