

## Electronic Supplementary Information

### Template-free Synthesis of Mesoporous NaTbF<sub>4</sub> and NaTbF<sub>4</sub>:Eu Nano-rice and Their Luminescence Properties

Zhiming Chen,<sup>a,b</sup> Zhirong Geng,<sup>a</sup> Dalin Shao,<sup>a</sup> Zhiping Zhou<sup>a</sup> and Zhilin Wang<sup>\*a</sup>

<sup>a</sup> State Key Laboratory of Coordination Chemistry, School of Chemistry and Chemical Engineering, Nanjing University, Nanjing 210093, People's Republic of China.

<sup>b</sup> Department of Biochemical Engineering, Anhui Polytechnic University, Wuhu 241000, People's Republic of China.

\*Corresponding author. Tel.: +86-25-83686082 Fax: +86-25-83317761 E-mail: [wangzl@nju.edu.cn](mailto:wangzl@nju.edu.cn)

Fig. S1 XRD patterns for NaTbF<sub>4</sub> product prepared at 110 °C for (a) 0.5 h, (b) 2 h and (c) 6 h, respectively.

Fig. S2 FT-IR spectrum of NaTbF<sub>4</sub> products obtained at 110 °C for 0.5 h.

Fig. S3 SEM images of mesoporous NaTbF<sub>4</sub>:Eu nano-rice doped with a various amounts of Eu<sup>3+</sup>.

Fig. S4 XRD patterns of NaTbF<sub>4</sub>:Eu products doped with a various amounts of Eu<sup>3+</sup>.

Fig. S5 EDX spectra of NaTbF<sub>4</sub>:Eu products doped with a various amounts of Eu<sup>3+</sup>.

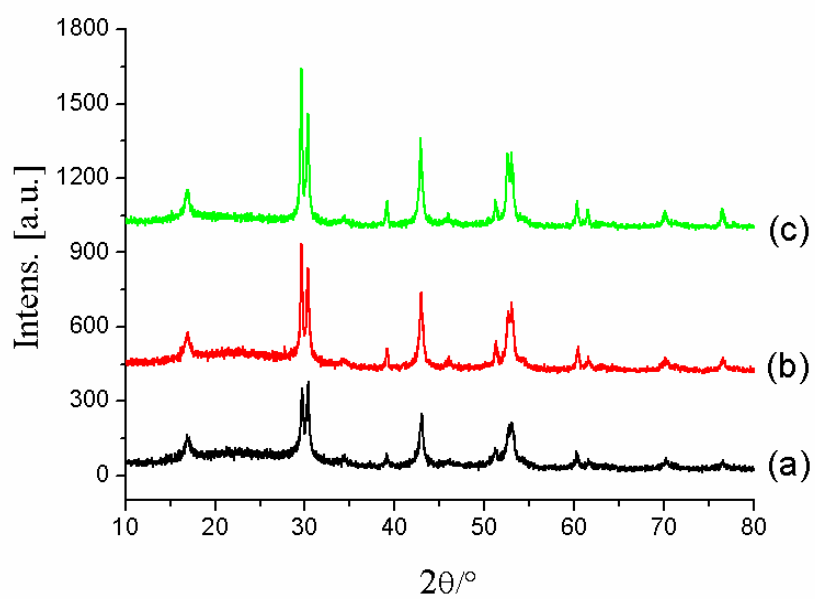


Fig. S1 XRD patterns for NaTbF<sub>4</sub> product prepared at 110 °C for (a) 0.5 h, (b) 2 h and (c) 6 h, respectively.

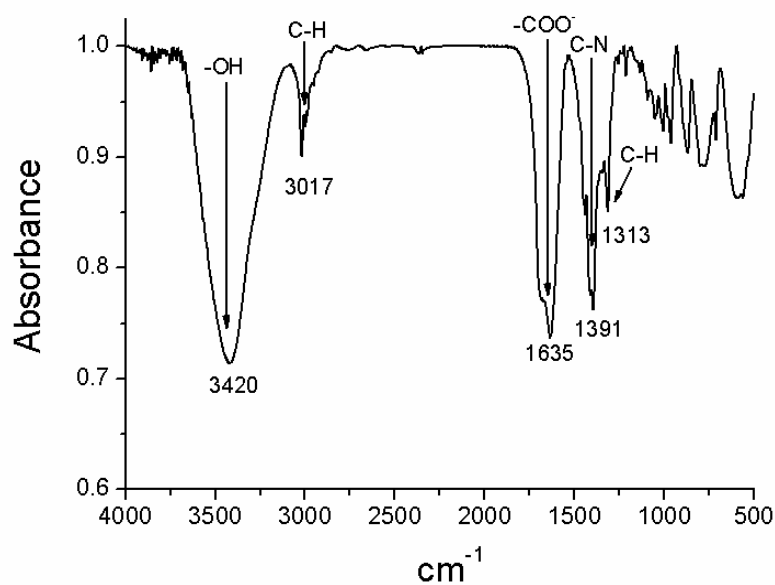


Fig. S2 FT-IR spectrum of NaTbF<sub>4</sub> products obtained at 110 °C for 0.5 h. The wide band at 3100 ~ 3600 cm<sup>-1</sup> was assigned to hydrogen-bonded O-H stretching vibrations, the band at ~ 3017 cm<sup>-1</sup> was assigned to the asymmetric ( $\nu_{as}$ ) stretching vibrations of methylene (CH<sub>2</sub>) in the EDTA. The band at ~ 1635 cm<sup>-1</sup> was assigned to  $\nu_{as}(\text{OCO})$  asymmetric stretch vibrations. The band at ~ 1391 cm<sup>-1</sup> was assigned to C-N stretching modes, the bands at ~ 1314 cm<sup>-1</sup> can be assigned to  $\delta(\text{C-H})$  bending vibrations.

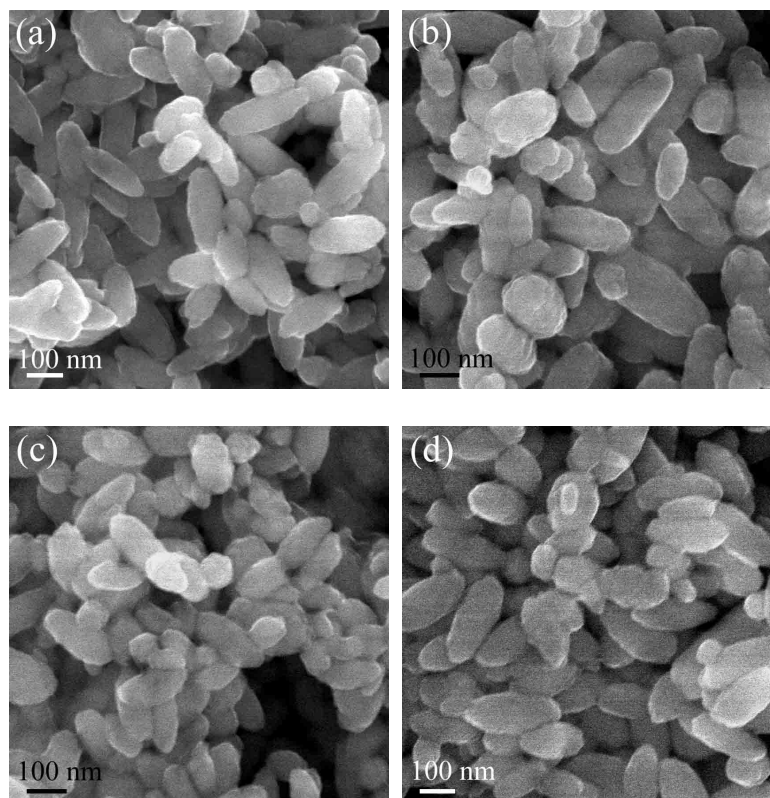


Fig. S3 SEM images of mesoporous NaTbF<sub>4</sub>:Eu nano-rice doped with a various amounts of Eu<sup>3+</sup>: 95, 25, 10, and 2%, which were obtained in the solution with molar ratio of Tb<sup>3+</sup> to Eu<sup>3+</sup> at (a) 1/19, (b) 3/1, (c) 9/1 and (d) 49/1, respectively.

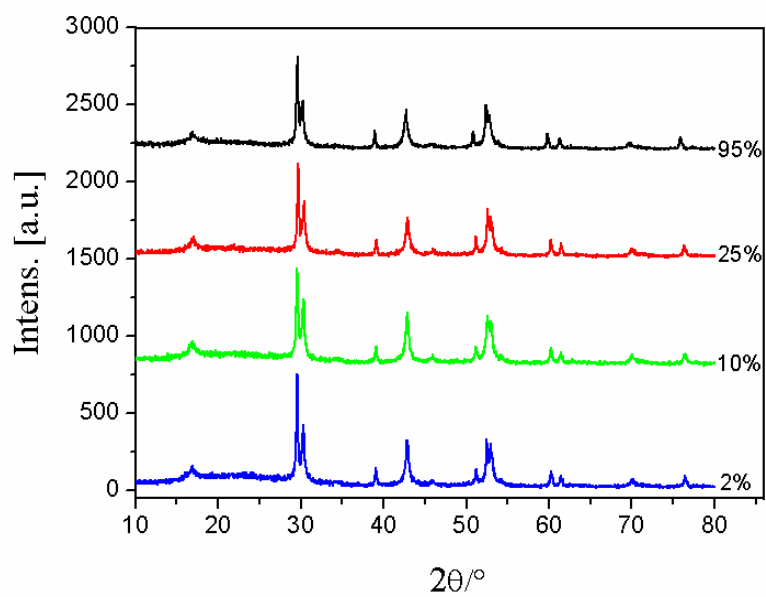
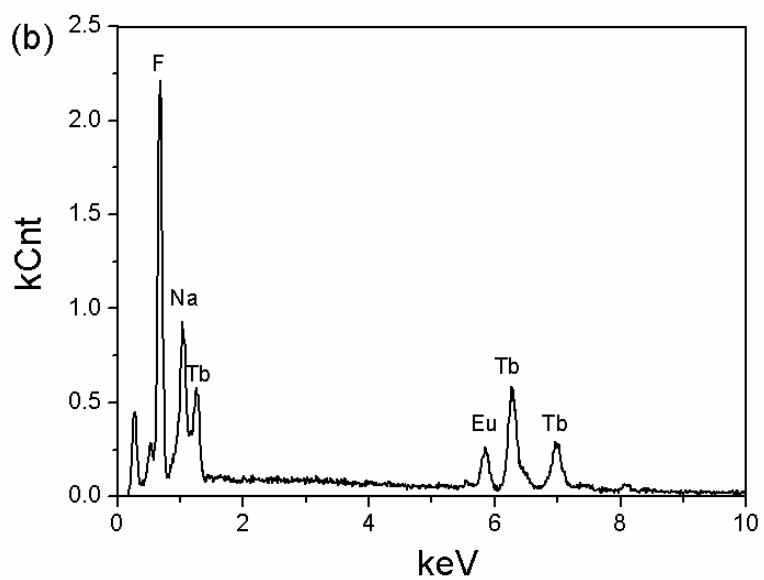
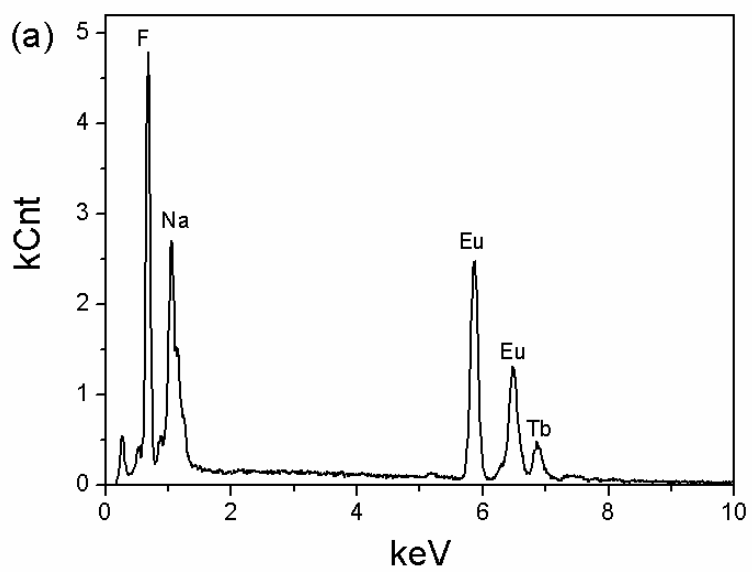


Fig. S4 XRD patterns of NaTbF<sub>4</sub>:Eu products doped with a various amounts of Eu<sup>3+</sup>:  
2, 10, 25, and 95%.



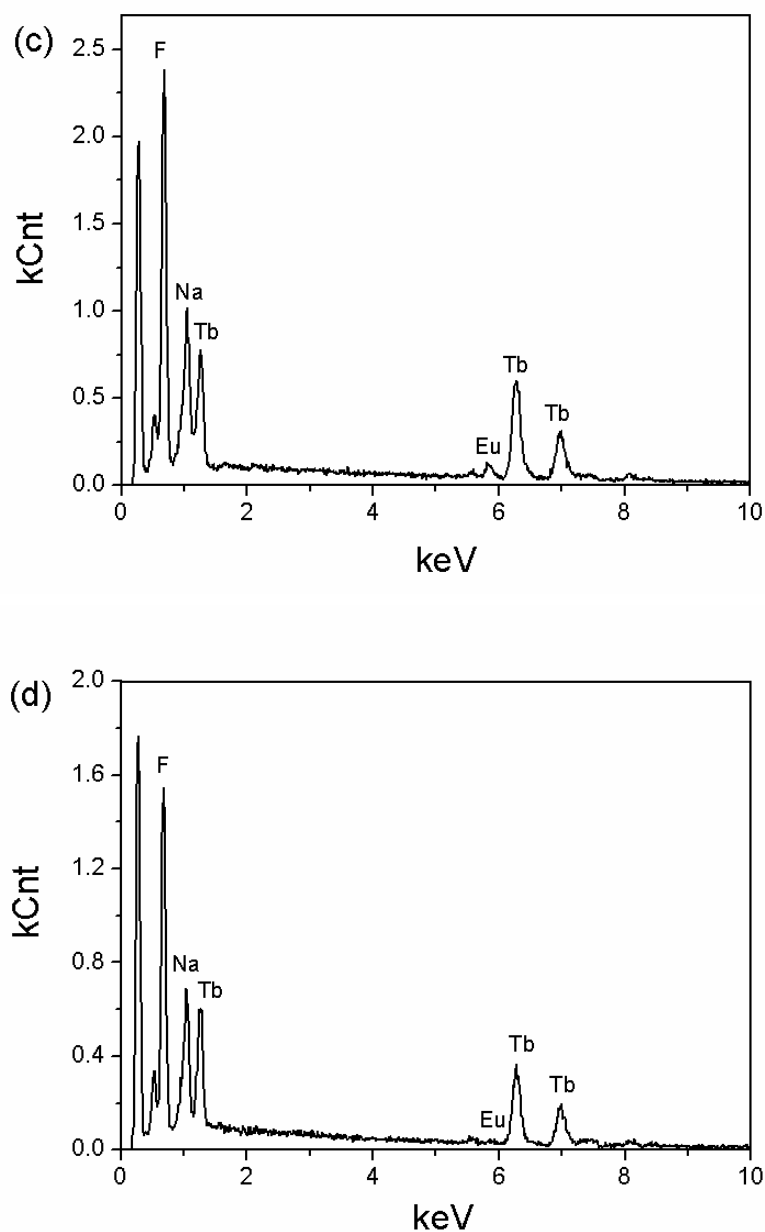


Fig. S5 EDX spectra of (a) mesoporous NaTbF<sub>4</sub>:Eu (95%) nano-rice with quantities of F, Na, Eu and Tb at a ratio of 63.39/18.75/16.95/0.91, (b) mesoporous NaTbF<sub>4</sub>:Eu (25%) nano-rice with quantities of F, Na, Eu and Tb at a ratio of 62.84/19.43/4.42/13.31, (c) mesoporous NaTbF<sub>4</sub>:Eu (10%) nano-rice with quantities of F, Na, Eu and Tb at a ratio of 64.10/18.98/1.54/15.38, and (d) mesoporous NaTbF<sub>4</sub>:Eu (2%) nano-rice with quantities of F, Na, Eu and Tb at a ratio of 64.83/19.39/0.31/15.47, respectively.