Supplementary Information

Grafting of terbium (III) complexes on layered rare-earth hydroxide nanosheets to fabricate novel optical fiber temperature sensors

Qi Zhu, a,b Siyuan Li, a,b Qi Wang, c Yang Qi, d Xiaodong Li, a,b Xudong Sun, a,b and Ji-Guang Li* e

a Key Laboratory for Anisotropy and Texture of Materials (Ministry of Education), Northeastern University, Shenyang, Liaoning 110819, China
b Institute of Ceramics and Powder Metallurgy, School of Materials Science and Engineering, Northeastern University, Shenyang, Liaoning 110819, China
c College of Information Science and Engineering, Northeastern University, Shenyang, Liaoning 110819, China
d Institute of Materials Physics and Chemistry, School of Materials Science and Engineering, Northeastern University, Shenyang, Liaoning 110819, China
e Research Center for Functional Materials, National Institute for Materials Science, Namiki 1-1, Tsukuba, Ibaraki 305-0044, Japan

Corresponding Author

*E-mail: zhuq@smm.neu.edu.cn (Qi Zhu)
*E-mail: LI.Jiguang@nims.go.jp (Ji-Guang Li)
Figure S1. XRD patterns of Y(hfa)$\textsubscript{3}$(H$_2$O)$_3$ and Tb(hfa)$\textsubscript{3}$(H$_2$O)$_3$.

Figure S2. FT-IR spectra of Y(hfa)$\textsubscript{3}$(H$_2$O)$_3$, Tb(hfa)$\textsubscript{3}$(H$_2$O)$_3$ and hfa.
Figure S3. PL spectra of the films at the heating temperatures of 300 K and 360 K, as a function of grafting content of Tb complex.
Figure S4. PL spectra of the two-layer film excited by 333 nm, as a function of heating temperature from 77 K to 360 K.

Figure S5. PL spectra of the two-layer film excited by 273 nm, as a function of heating temperature from 77K to 360 K.
Figure S6. Fluorescence decay curves for the 546-nm emission of film at different heating temperatures. The scattered data points and the solid lines are the experimental and fitting results, respectively.

Figure S7. Temperature-dependence of the energy transfer efficiency from Tb$^{3+}$ to Eu$^{3+}$. 
Figure S8. FE-SEM morphology of the two-layer film on optical fiber.