

## Supporting information

### **Developing dual-mode material with ultraviolet and visible persistent luminescence for multi-mode anti-counterfeiting and information encryption**

*Lin Liu<sup>abc&</sup>, Jixuan Xu<sup>ab&</sup>, Yiang Li<sup>ab</sup>, Shanshan Peng<sup>ab</sup>, Peng Lin<sup>ab</sup>, Hongyun Zhong<sup>ab</sup>, Liang Song<sup>ab</sup>, Junpeng Shi<sup>abc</sup>, Xia Sun<sup>d,\*</sup> and Yun Zhang<sup>abc,\*</sup>*

<sup>a</sup>State Key Laboratory of Structural Chemistry, Fujian Institute of Research on the Structure of Matter, Chinese Academy of Sciences, Fuzhou 350002, China

<sup>b</sup>Xiamen Key Laboratory of Rare Earth Photoelectric Functional Materials, Xiamen Institute of Rare Earth Materials, Haixi Institute, Chinese Academy of Sciences, Xiamen 361021, China

<sup>c</sup>University of Chinese Academy of Sciences, Beijing 100049, China

<sup>d</sup>Fujian Science and Technology Innovation Laboratory for Optoelectronic Information of China, Fuzhou 350108, China

E-mail: sunxia@fjoel.cn;

E-mail: zhangy@fjirsm.ac.cn

&: Author Lin Liu and author Jixuan Xu contributed equally to this work.

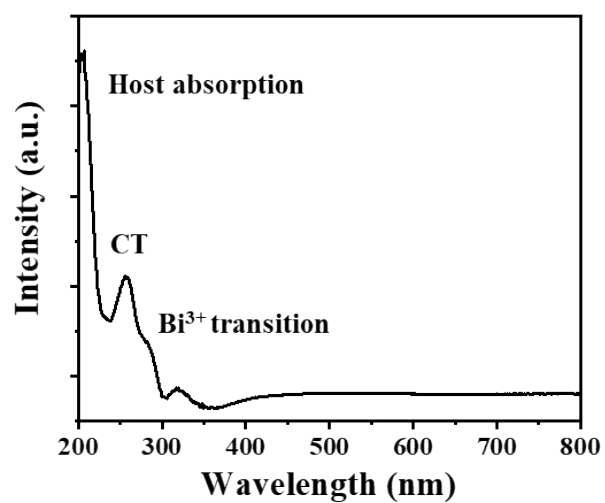


Figure S1. UV-Vis absorption spectrum of MLGO:Bi<sup>3+</sup>.

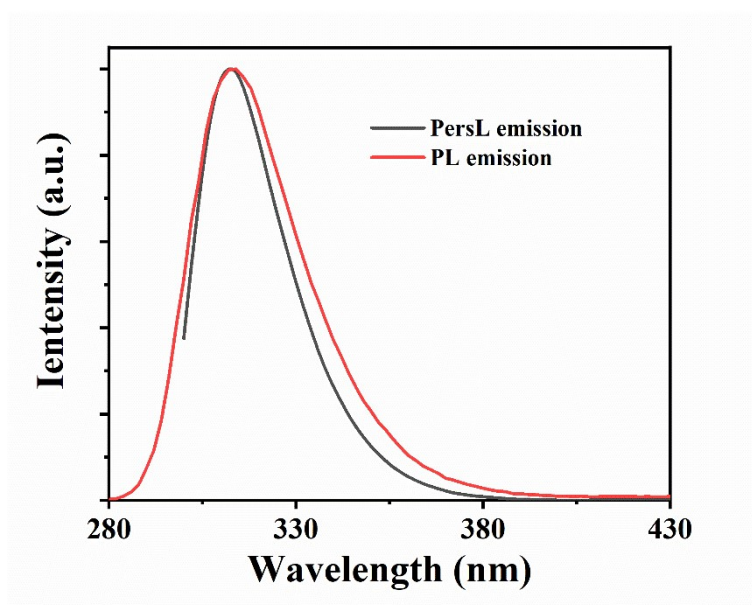


Figure S2. PersL and PL emission spectra of MYGO:Bi<sup>3+</sup>.

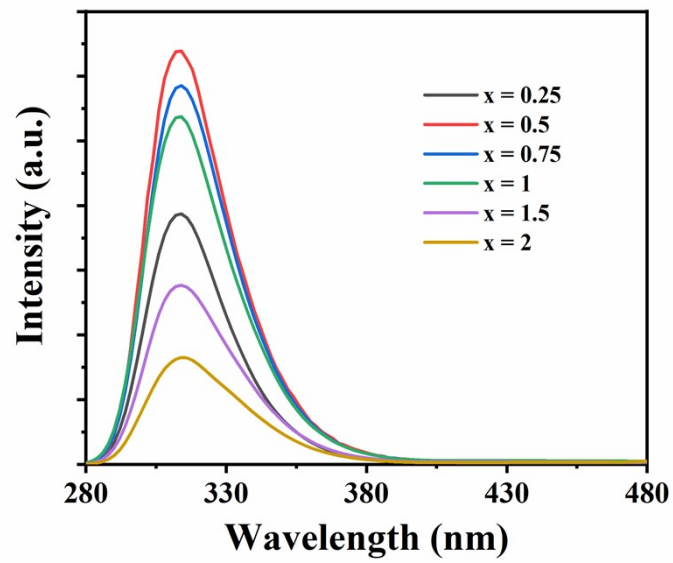


Figure S3. PersL emission spectra of MYGO:x%Bi<sup>3+</sup>.

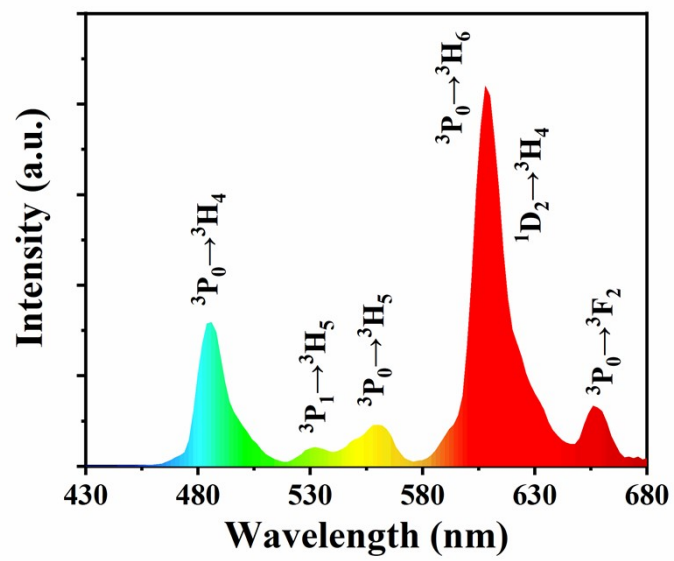
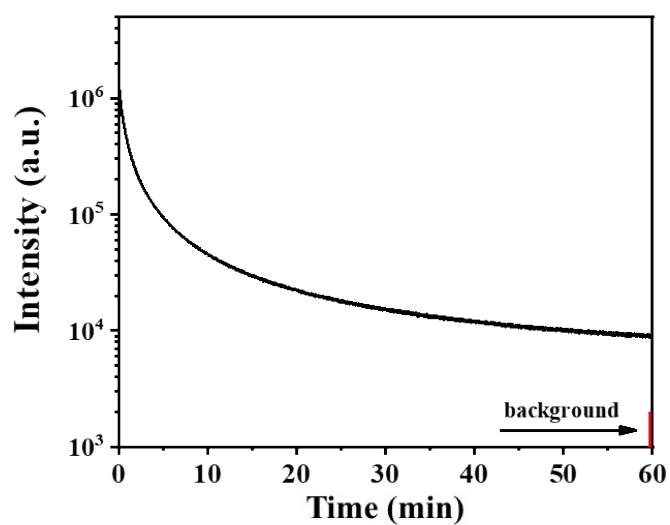
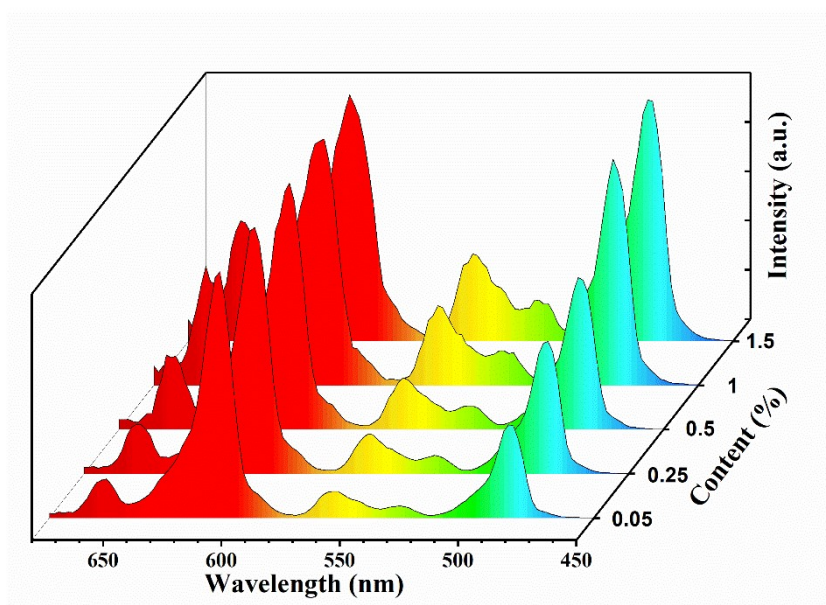


Figure S4. PL emission spectrum of MYGO:Pr<sup>3+</sup>.



**Figure S5.** PersL decay curve of MLGO:0.5%Bi<sup>3+</sup>,0.5%Pr monitoring at 615 nm.



**Figure S6.** PersL emission spectra of MYGO:x%Pr<sup>3+</sup>.

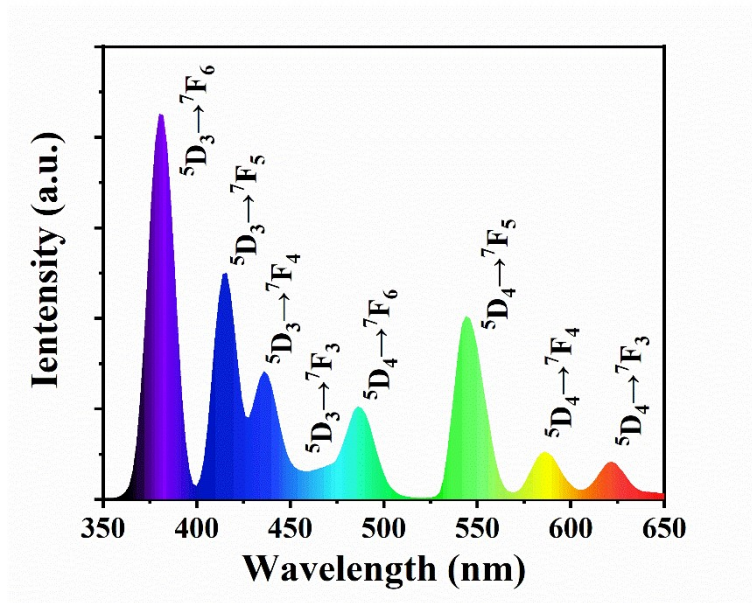


Figure S7. PL emission spectrum of MYGO:Tb<sup>3+</sup>.

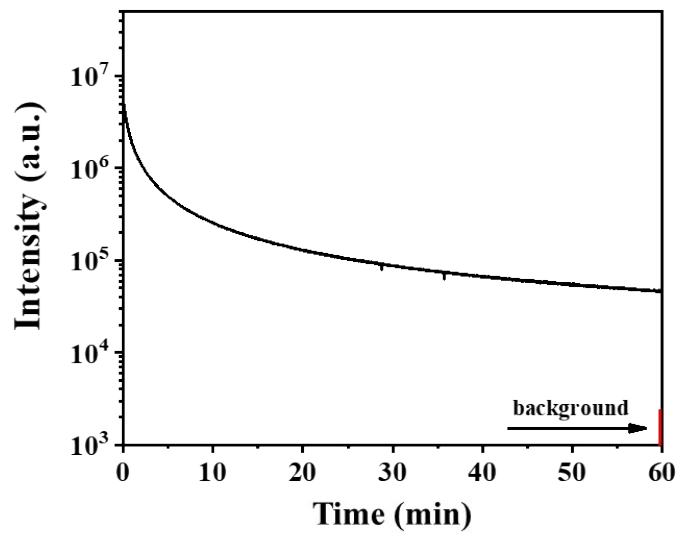
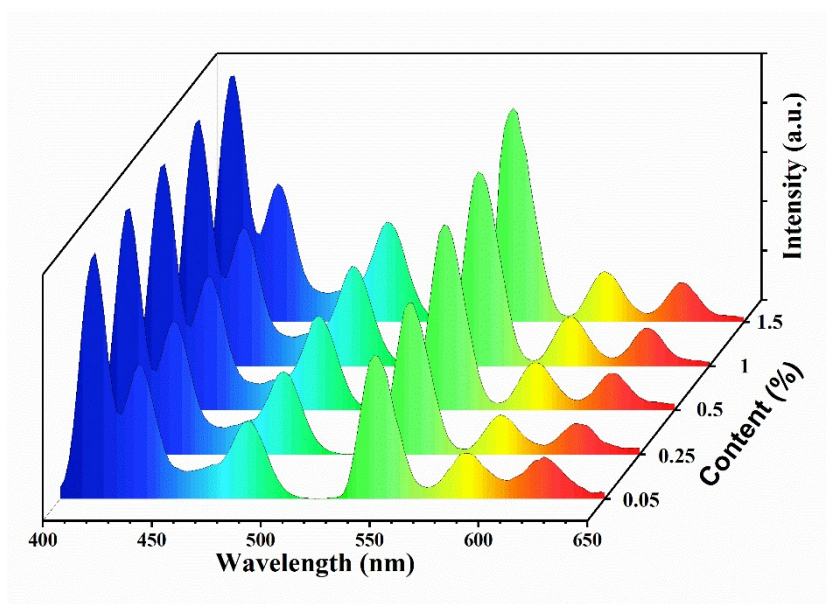


Figure S8. PersL decay curve of MLGO:0.5%Bi<sup>3+</sup>,0.5%Tb monitoring at 540 nm.



**Figure S9.** PersL emission spectra of MYGO:x%T