## SUPPORTING INFORMATION

Improving the luminous efficacy and the resistance to blue laser irradiation of phosphor-in-glass based solid state laser lighting through employing dual-functional sapphire plate

Xuejie Zhang,<sup>a,b</sup> Shuaichen Si,<sup>a</sup> Jinbo Yu,<sup>a</sup> Zijun Wang,<sup>c</sup> Ronghuan Zhang,<sup>d</sup> Bingfu Lei,<sup>b</sup> Yingliang Liu,<sup>b</sup> Jianle Zhuang,<sup>b</sup> Chaofan Hu,<sup>b</sup> Yujin Cho,<sup>e</sup> Rong-Jun Xie,<sup>e</sup> Hong-Wu Zhang,<sup>f</sup> Zifeng Tian,<sup>g</sup> and Jing Wang<sup>\*,a</sup>

\*E-mail: ceswj@mail.sysu.edu.cn

<sup>a</sup>Ministry of Education Key Laboratory of Bioinorganic and Synthetic Chemistry, State Key Laboratory of Optoelectronic Materials and Technologies, School of Chemistry, School of Materials Science and Engineering, Sun Yat-sen University, Guangzhou 510275, Guangdong, China <sup>b</sup>College of Materials and Energy, South China Agricultural University, Guangzhou 510642, Guangdong, China <sup>c</sup>Condensed Matter and Interfaces, Debye Institute for Nanomaterials Science, Utrecht University, Princetonplein 1, 3584 CC Utrecht, Netherlands <sup>d</sup>Chimie du Solide et de l'Energie, Collège de France, UMR 8260, 75231 Paris Cedex 05, France <sup>e</sup>Sialon Group, National Institute for Materials Science (NIMS), 1-1 Namiki, Tsukuba 305-0044, Japan <sup>f</sup>Key Lab of Urban Pollutant Conversion, Institute of Urban Environment, Chinese Academy of Sciences, Xiamen 361021, Fujian, China <sup>g</sup>Appotronics Corporation Limited, Shenzhen 518057, Guangdong, China



**Fig. S1.** SEM images of host glass (a,c,e,g) and 5 wt% YAG-PiG sample (b,d,f,h) under different magnification.



**Fig. S2.** EDS of different areas in Figure 2a (area 1) and Figure 2e (areas 2 and 3) of 5 wt % YAG-PiG sample.



**Fig. S3.** Surface fluorescence distribution images (a,c) and 3D reconstruction images (b,d) of 5 wt % YAG-PiG sample.



**Fig. S4.** CCT and CRI variations of white LDs and white LDs@sapphire with increasing the irradiation laser power.