

Supporting Information

Supporting Information

Green-Emissive $\text{Ce}^{3+}:\text{Lu}_3\text{Al}_5\text{O}_{12}-\text{Al}_2\text{O}_3$ Nanoceramics Elaborated via Glass Crystallization for High-Power Laser Lighting Applications

Jie Fu,^{a,b,d} Shaowei Feng,^{b,d} Cécile Genevois,^c Emmanuel Véron,^c Yafeng Yang,^{b,d} Hui Wang,^{b,d} Zhibiao Ma,^a Linghan Bai,^a Wenlong Xu,^a Ruyi Fan,^a Chengzhi Wang,^a Mathieu Allix^{*c}, and Jianqiang Li^{*a,b,d}

^a School of Materials Science and Engineering, University of Science and Technology Beijing, P. R. China.

E-mail: jianqiangli@ustb.edu.cn

^b State Key Laboratory of Mesoscience and Engineering, Institute of Process Engineering, Chinese Academy of Sciences, Beijing 100190, China.

^c CNRS, CEMHTI UPR 3079, Univ. Orléans, France.

E-mail: mathieu.allix@cnrs-orleans.fr

^d University of Chinese Academy of Sciences, P. R. China

Supporting note 1: Flowchart of the preparation of transparent $\text{Ce}:\text{LuAG}-\text{Al}_2\text{O}_3$ nanoceramics

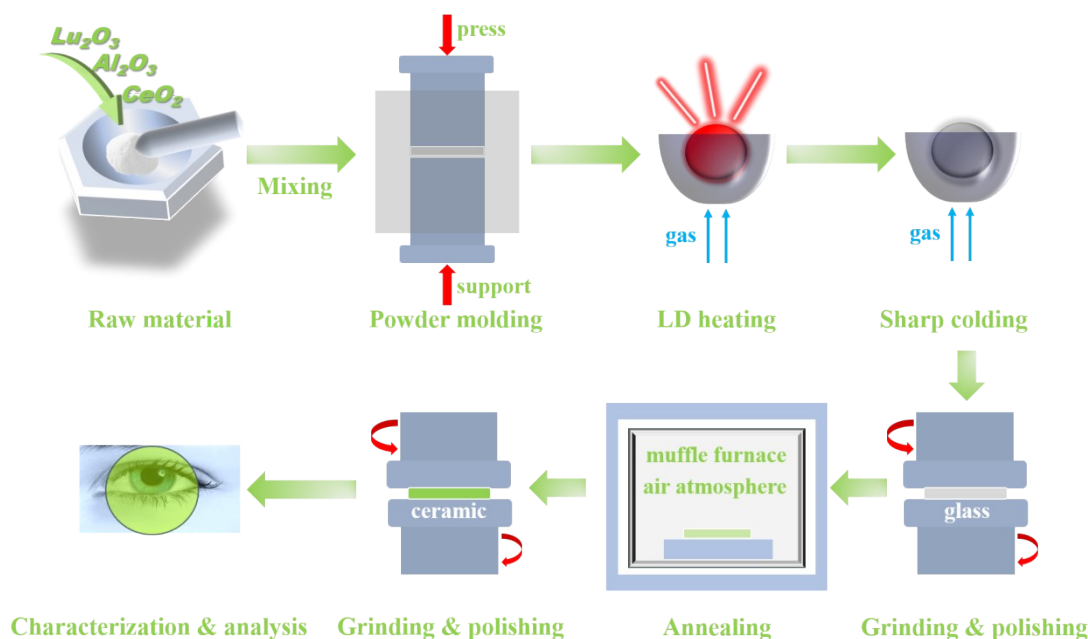


Figure S1. Flowchart of the preparation of transparent $\text{Ce}:\text{LuAG}-\text{Al}_2\text{O}_3$ nanoceramics.

Supporting note 2: Normalized photoluminescence emission (PL) spectra of the transparent 0.3% $\text{Ce}:\text{LuAG}-\text{Al}_2\text{O}_3$ nanoceramics crystallized at 1200 °C

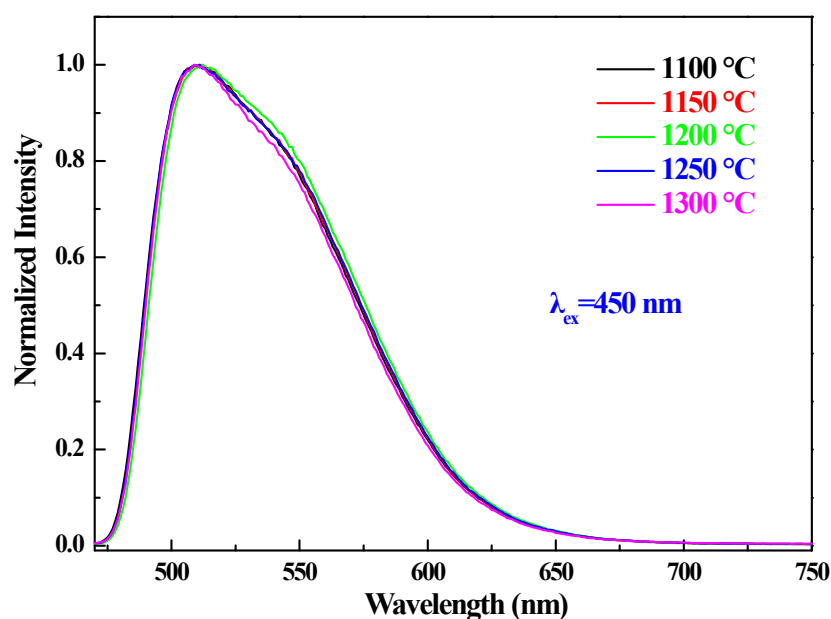


Figure. S2 Normalized photoluminescence emission (PL) spectra ($\lambda_{\text{ex}}=450$ nm) of the transparent 0.3%Ce:LuAG-Al₂O₃ nanoceramics crystallized at 1200 °C

Supporting note 3: The crystallite sizes of the transparent 0.3%Ce:LuAG-Al₂O₃ nanoceramics crystallized at different temperatures.

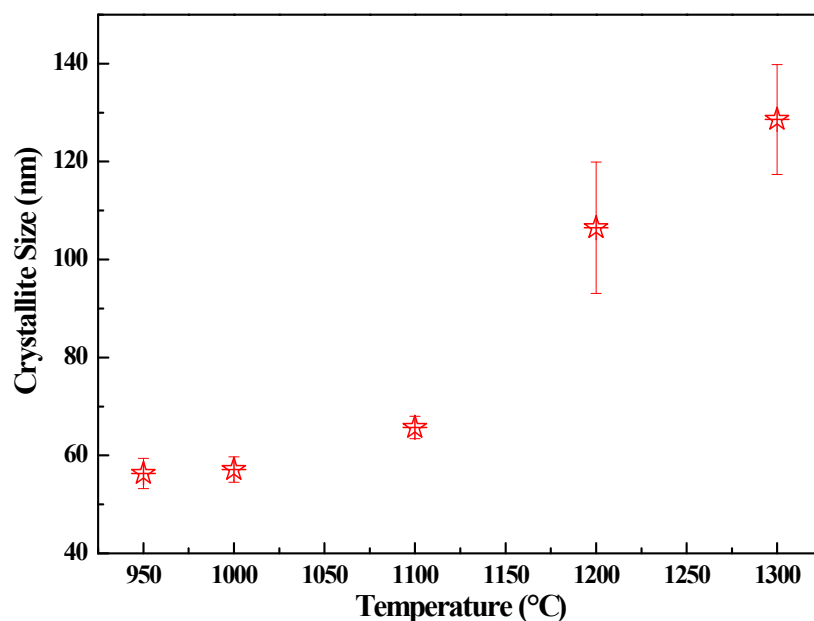


Figure. S3 The crystallite sizes of the transparent 0.3%Ce:LuAG-Al₂O₃ nanoceramics crystallized at different temperatures. Calculated based on XRPD results.

Supporting note 4: XRPD refinement of the transparent 0.3%Ce:LuAG-Al₂O₃ nanoceramics crystallized at 1200 °C

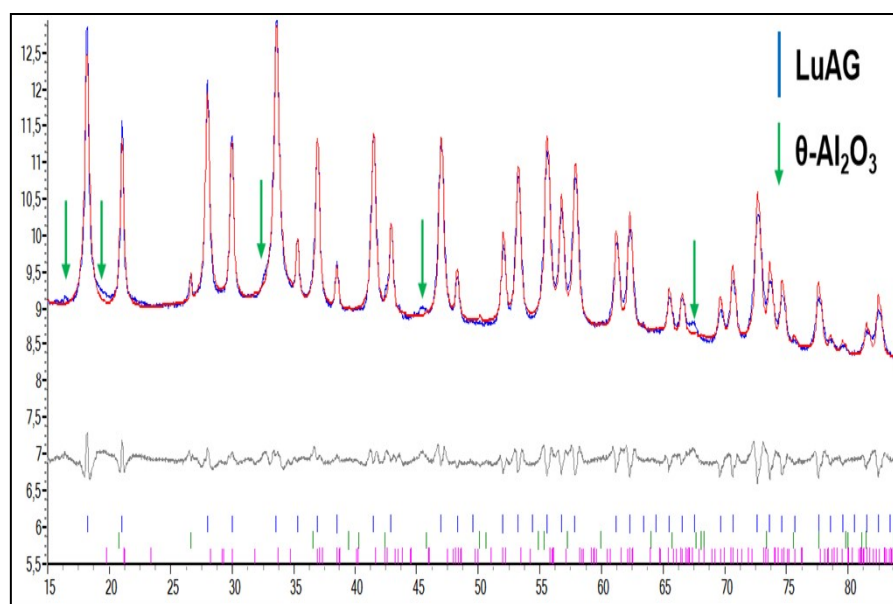


Figure. S4 XRPD refinement of the transparent 0.3%Ce:LuAG- Al_2O_3 nanoceramics crystallized at 1200 °C.

Supporting note 5: EDS elemental maps of Lu and Al (blue and red) of transparent Ce:LuAG- Al_2O_3 nanoceramics crystallized at 1200 °C

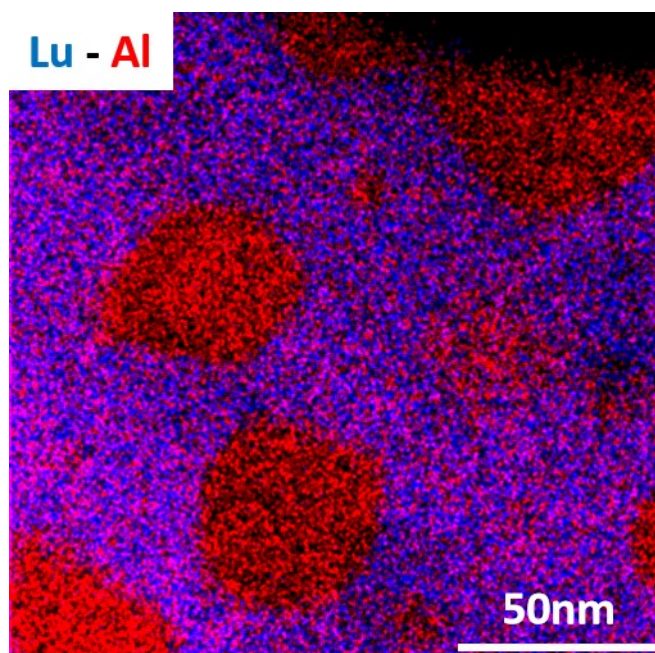


Figure. S5 EDS elemental maps of Lu and Al (blue and red) of transparent Ce:LuAG- Al_2O_3 nanoceramics crystallized at 1200 °C.

Supporting note 6: Schematic diagram of LD lighting device analysis system

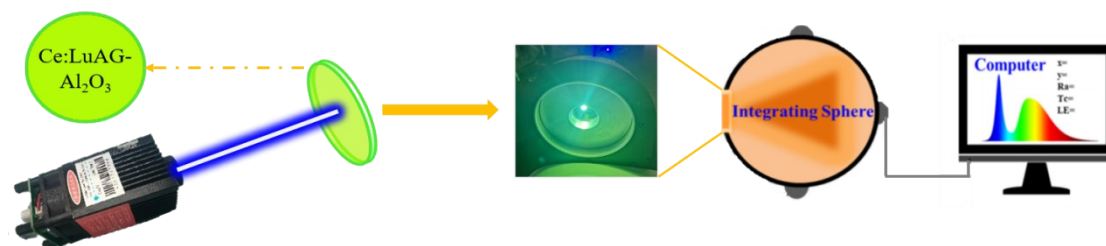


Figure. S6 Schematic diagram of LD lighting device analysis system.