

Supplementary materials for

# Micro-nonuniformity of the luminescence parameters in compositionally disordered GYAGG:Ce ceramics

Valery Dubov<sup>1,2</sup>, Maria Gogoleva<sup>3</sup>, Rasim Saifutytarov<sup>2</sup>, Ostap Kucherov<sup>1,2</sup>, Mikhail Korzhik<sup>1,4</sup>, Daria Kuznetsova<sup>1,2</sup>, Ilya Komendo<sup>1,2</sup> and Petr Sokolov<sup>2,\*</sup>

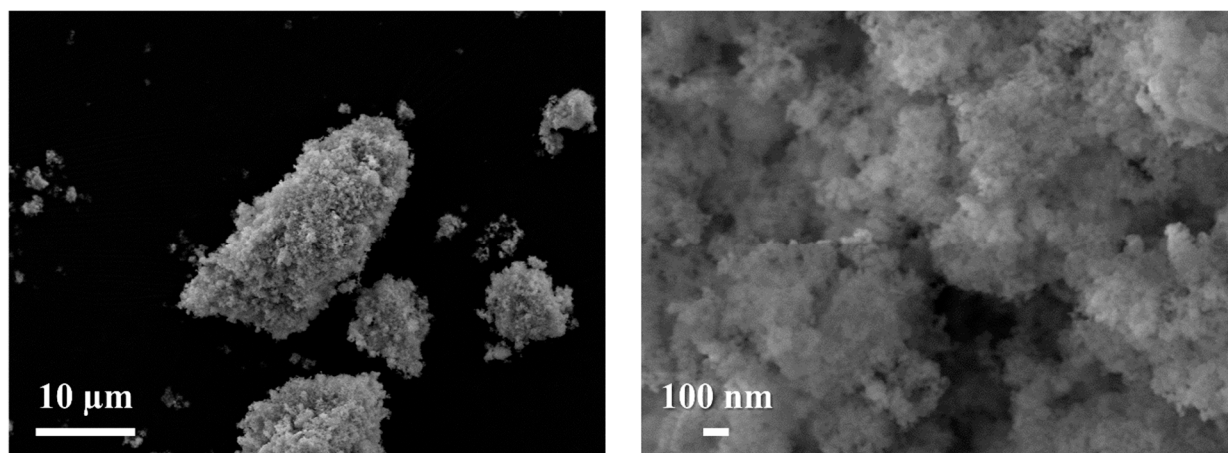
<sup>1</sup> National Research Center "Kurchatov Institute", 123098, Moscow, Russia

<sup>2</sup> NRC "Kurchatov Institute" — IREA, 107076, Moscow, Russia

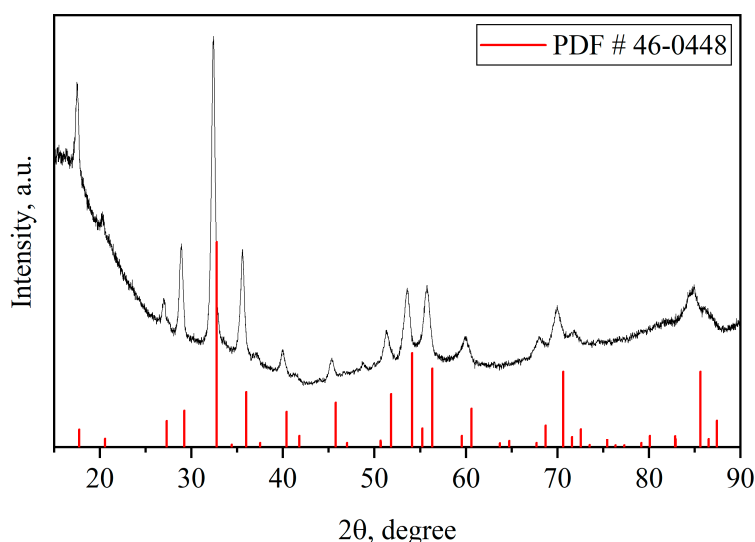
<sup>3</sup> Center for Materials Technologies, Skolkovo Institute of Science and Technology, 121205, Moscow, Russia

<sup>4</sup> Institute for Nuclear Problems, Belarus State University, 11 Bobruiskaya, 220030, Minsk, Belarus

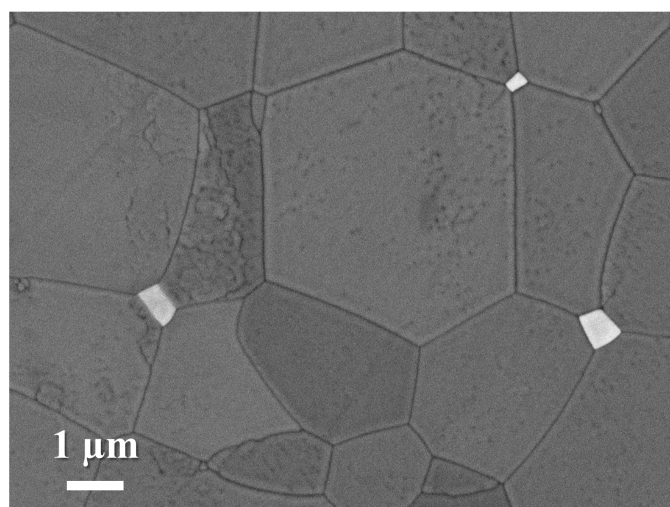
\* Correspondence: sokolov-petr@yandex.ru



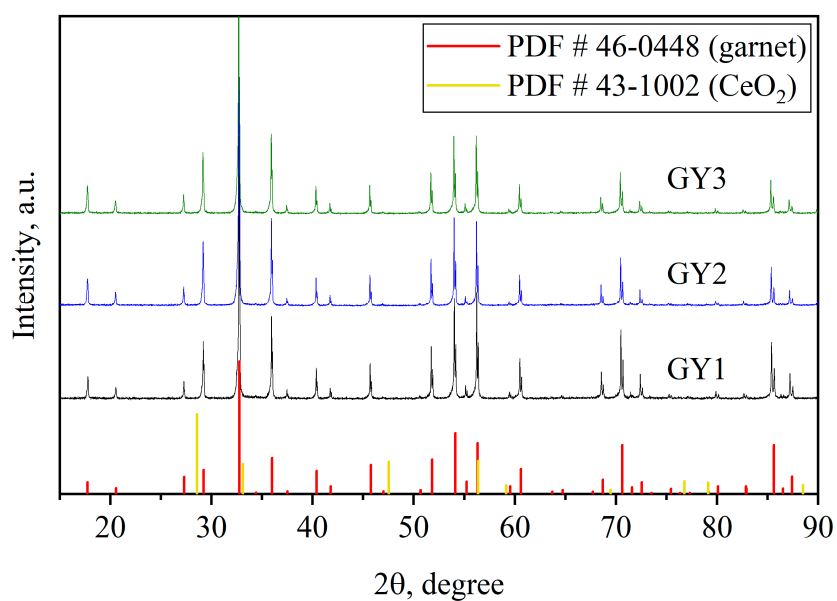
**Figure S1.** Representative SEM images (secondary electron mode) of GYAGG with 0.015 f.u. Ce powder used in this work. Powder calcined at 850 °C



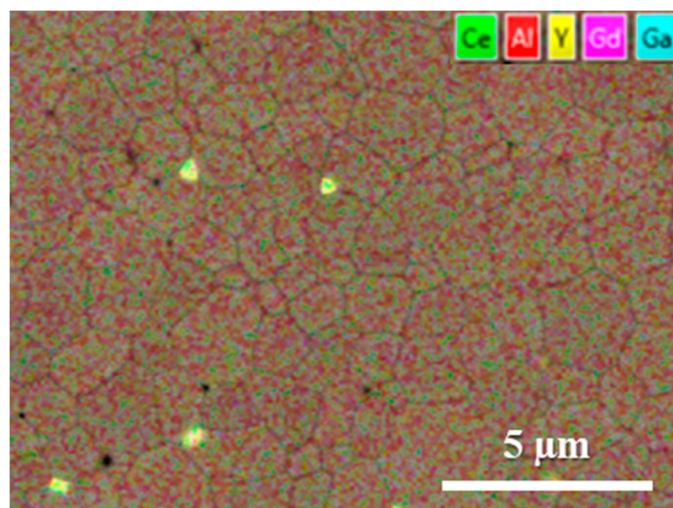
**Figure S2.** The XRD pattern of 850 °C-calcined GYAGG powder GY2 (black line) and standard PDF card of # 46-0448 ( $\text{Gd}_3\text{Ga}_2\text{Al}_3\text{O}_{12}$ ): X-ray phase analysis was performed on a Bruker D2 PHASER instrument with a copper X-ray source ( $\text{CuK}\alpha_{1,2}$ ) in the  $2\theta$  range from 10 to 90° and a slit width in front of the detector of 0.1 mm



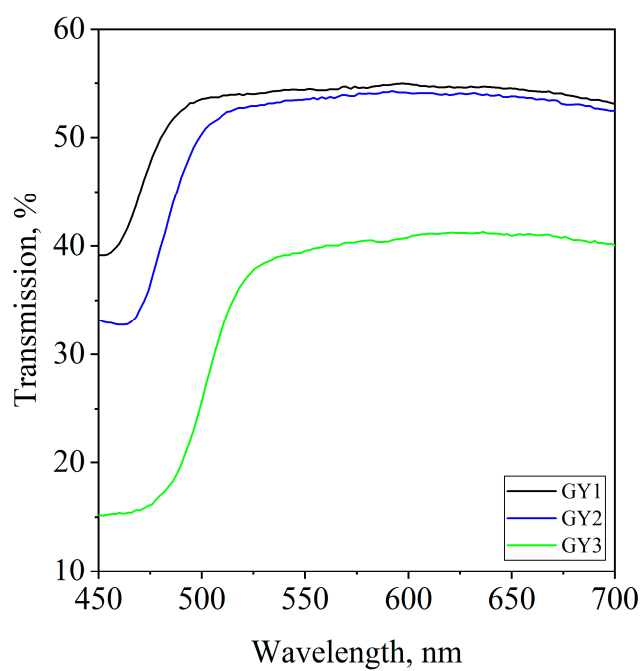
**Figure S3.** The additional SEM image of GYAGG ceramic sample GY3 (back-scattered electron mode) with example of a few inclusions



**Figure S4.** The XRD patterns of GYAGG ceramics and standard PDF cards of # 46-0448 ( $\text{Gd}_3\text{Ga}_2\text{Al}_3\text{O}_{12}$ ) and # 43-1002 ( $\text{CeO}_2$ ): X-ray phase analysis was performed on a Bruker D2 PHASER instrument with a copper X-ray source ( $\text{CuK}\alpha_{1,2}$ ) in the  $2\theta$  range from 10 to  $90^\circ$  and a slit width in front of the detector of 0.1 mm. No lines of any secondary phases were found in the samples



**Figure S5.** EDS map of GYAGG ceramic sample GY3 (back-scattered electron mode) measured using a Jeol JSM-7100F scanning electron microscope with a Schottky cathode and a resolution of 3 nm at an accelerating voltage of 20 kV.



**Figure S6.** Total transmission spectra of GYAGG ceramic samples (1 mm thickness) measured using Analytik Jena Specord Plus spectrophotometer equipped with an integrating sphere