

First International Conference

**PROCESSING, CHARACTERIZATION  
AND APPLICATION OF  
NANOSTRUCTURED MATERIALS AND  
NANOTECHNOLOGY**

**PROGRAMME  
&  
BOOK of ABSTRACTS**

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NANOSTRUCTURED MATERIALS AND NANOTECHNOLOGY**

*First International Conference, NanoBelgrade 2012*

**PROGRAMME & BOOK of ABSTRACTS**

Izdavač:

Tehnološko-metalurški fakultet  
Univerziteta u Beogradu  
Beograd, Karnegijeva 4

Za izdavača:

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### **Up-converting characteristics of Y<sub>2</sub>O<sub>3</sub>:Yb/Er nanocrystalline powders obtained through spray pyrolysis**

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Sub-micronic, spherical Y<sub>2</sub>O<sub>3</sub>:Yb/Er particles comprising clustered nano-units were prepared through ultrasonic spray pyrolysis of pure nitrate precursor solutions that contain different Yb/Er dopants ratio (10, 5 and 2). The particles obtained were additionally heat treated at 1100°C for 12, 24 and 48 hours. Detailed structural and morphological analysis were done through X-ray powder diffraction (XRPD), scanning and transmission electron microscopy (SEM/TEM), specific surface area (BET), particle size distribution (LPS) and Fourier Transform Infrared spectroscopy (FTIR). Obtained results are further correlated with advanced powder optical properties confirmed by efficient up-conversion emissions of Er<sup>3+</sup> in: blue (407-420 nm, 2H<sub>9/2</sub>→4I<sub>15/2</sub>), green (510-590 nm, 2H<sub>11/2</sub>, 4S<sub>3/2</sub> → 4I<sub>15/2</sub>) and red (640-720 nm, 4F<sub>9/2</sub>→4I<sub>15/2</sub>) spectra. The corresponding lifetimes in the function of temperature will be also presented and discussed.