

**The 3rd International Conference on the Physics
of Optical Materials and Devices**

BOOK OF ABSTRACTS

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HYDROTHERMAL SYNTHESIS OF NANOSTRUCTURED RARE EARTH OXIDE – BASED PHOSPHORS

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Synthesis of nanostructured rare earth oxide-based phosphor particles with enhanced optical characteristics leads to the creation of the new photonic devices with diverse applications. Tailoring of the phosphors quality depends on our ability to utilize the best of their intrinsic structure through the control of nucleation and growth process of the desired phase. A large number of works have contributed to the better control of particle shape and crystal growth in soft-chemistry routes. Here, examples from $(Y_2O_3-Gd_2O_3):Eu^{3+}$ and $Y_2O_3:(Yb^{3+}/Er^{3+})$ will be presented to highlight the controlled synthesis of 1D and 2D nanostructures through simple hydrothermal method. Conversion of the starting nitrates mixture into carbonate hydrate phase is performed with the help of ammonium hydrogen carbonate solution during hydrothermal treatment at 200°C/3h. Morphological architectures of rare earth oxides obtained after subsequent thermal treatment and their correlation with the optical characteristics will be discussed based on X-ray powder diffractometry, particle size analysis, scanning electron microscopy, X-ray energy dispersive spectroscopy, transmission electron microscopy and photoluminescence measurements.