FIFTEENTH YOUNG RESEARCHERS' CONFERENCE
MATERIALS SCIENCE AND ENGINEERING

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Program and the Book of Abstracts

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Aim of the Conference

Main aim of the conference is to enable young researchers (post-graduate, master or doctoral student, or a PhD holder younger than 35) working in the field of materials science and engineering, to meet their colleagues and exchange experiences about their research.

Topics

Biomaterials
Environmental materials
Materials for high-technology applications
Nanostructured materials
New synthesis and processing methods
Theoretical modelling of materials

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Results of the Conference

Beside printed «Program and the Book of Abstracts», which is disseminated to all conference participants, selected and awarded peer-reviewed papers will be published in journals "Tehnika – Novi Materijali" and "Processing and Application of Ceramics". The best presented papers, suggested by Session Chairpersons and selected by Awards Committee, will be proclaimed at the Closing Ceremony.

Sponsors

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~ 1,8 nm reflects the annihilation in the water "bubbles" with radius near 3 Å. Its number increases in accordance with intensity I3.

Thus, it is shown that lifetimes of third and fourth positronium (o-Ps)-related component of PAL spectra decreases in water-immersed MgO-Al_2O_3 ceramics reflected decreasing of free-volume after water-immersion. The amount of biggest nanopores decreases, while positronium trapping in smaller nanopores carried out simultaneously with annihilation in water “bubbles”.

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Ethylenediaminetetraacetic acid (EDTA) assisted hydro/solvothermal synthesis of up-converting rare earth fluorides

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Over the last decade, a lot of effort was directed toward developing of the representative methodologies for the preparation of up-converting (UC) particles which exhibit a unique narrow visible emission when excited by lower-energy photon radiation. This work presents the impact of different processing parameters on structural, morphological and optical properties of up-converting (UC) rare earth fluorides obtained by hydro/solvothermal synthesis. Monodisperse $NaYF_4$:Yb_{3+}/Er_{3+} particles with different morphology, size and crystal phase were synthesized with a help of ethylenediaminetetraacetic acid (EDTA) through adjusting the precursor concentration, degree of doping, polarity of solvent and reaction time. They are characterized by X-ray powder diffraction, scanning and transmission electron microscopy, energy dispersive X-ray and Furrier transform infrared spectroscopy, as well as photoluminescence measurements. It was shown that particle size and phase composition are dependent on the precursor concentration, type of solvent and doping degree, while the cubic to hexagonal transformation of $NaYF_4$:Yb_{3+}/Er_{3+} phase is affected by the reaction time. The crystallization of the orthorhombic YF_3:Yb_{3+}/Er_{3+} phase is established either after decreasing concentration of dopants or increasing polarity of solvents. All of the synthesized particles exhibited efficient up-conversion emission which can be tuned from pure green to the yellowish-orange through control of particles size and phase composition.