



Serbian Ceramic Society Conference
ADVANCED CERAMICS AND APPLICATION X
New Frontiers in Multifunctional Material Science and Processing

Serbian Ceramic Society
Institute of Technical Sciences of SASA
Institute for Testing of Materials
Institute of Chemistry Technology and Metallurgy
Institute for Technology of Nuclear and Other Raw Mineral Materials

PROGRAM AND THE BOOK OF ABSTRACTS

Serbian Academy of Sciences and Arts, Knez Mihailova 35
Serbia, Belgrade, 26-27. September 2022.

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Dr. Nina Obradović

Dr. Lidija Mančić

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Dr. Suzana Filipović

Dr. Adriana Peleš Tadić

Dr. Jelena Živojinović

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- Basic Ceramic Science & Sintering
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- Modeling & Simulation
- Glass and Electro Ceramics
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investigated: simple mixing, thermal treatment induction and *in situ* synthesis/grafting reactions. Two amino acid precursors were separately tested in grafting procedures: pure alanine and alanine methyl ester hydrochloride. The efficiency of grafting was determined based on X-ray powder diffraction (XRPD), Fourier-transform infrared spectroscopy (FTIR), scanning electron microscopy (SEM) and thermal analyses (DSC, TG/DTA) of obtained powders, while complementary UV-VIS spectroscopy of supernatants was additionally performed for quantitative determination of non-grafted nitrogen using ninhydrin standardized procedure.

ORL8

Quantum efficiency of up-converting SrGd₂O₄:Yb,Er nanoparticles

Ivana Dinić¹, Tijana Stamenković², Nadežda Radmilović², Marina Vuković³,
Mihailo D. Rabasović⁴, Vesna Lojpur², Lidija Mančić¹

¹Institute of Technical Science of SASA, Knez-Mihailova 35/4, Belgrade, Serbia

²Department of Atomic Physics, Vinča Institute of Nuclear Sciences, National Institute of the Republic of Serbia, P.O. Box 522, 11001 Belgrade, University of Belgrade, Serbia

³Innovative Centre, Faculty of Chemistry, University of Belgrade, Serbia

⁴Photonic Center, Institute of Physics, Belgrade, University of Belgrade, Serbia

Up-conversion properties of SrGd₂O₄ nanoparticles co-doped with different Yb³⁺ and constant Er³⁺ ions were successfully prepared *via* sol-gel assisted combustion. Rietveld refinement and scanning/transmission electron microscopy with corresponding energy-dispersive X-ray spectroscopy revealed that obtained powders are composed of agglomerated nanoparticles with orthorhombic (*Pnma*) structure that have a uniform distribution of all constituting elements. Photoluminescence measurements implied intensification of the up-conversion (UC) emission in the visible part of spectrum with the increase of Yb³⁺ content, which is followed by a significant change in the green to red ratio. Two-photon UC processes are established as a result of Er³⁺ f-f electronic transitions: green emission at 523 and 551 nm (²H_{11/2}, ⁴S_{3/2} → ⁴I_{15/2}) as well as a red emission at 661 nm (⁴F_{9/2} → ⁴I_{15/2}). The highest value of absolute quantum efficiency (0.055%) is determined for SrGd₂O₄ nanoparticles doped with 0.5 at% of Er³⁺ and co-doped with 5 at% of Yb³⁺ ($\lambda_{exc}=976$ nm, power density 200W/cm²).

ORL9

Electronic structure of silver-bismuth iodide rudorffite nanomaterials studied by synchrotron radiation soft X-ray photoemission spectroscopy

D. K. Božanić^{1,2}, D. Danilović^{1,2}, A. R. Milosavljević³, P. Sapkota^{4,5}, R. Dojčilović^{1,2},
D. Tošić¹, N. Vukmirović⁶, S. Ptasińska^{4,5}, and V. Djoković^{1,2}

¹Department of Radiation Chemistry and Physics, "Vinča" Institute of Nuclear Sciences - National Institute of the Republic of Serbia, University of Belgrade, P.O. Box 522, 11001 Belgrade, Serbia

²Center of Excellence for Photoconversion, "Vinča" Institute of Nuclear Sciences - National Institute of the Republic of Serbia, University of Belgrade, P.O. Box 522, 11001 Belgrade, Serbia