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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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 $SrGd_2O_4$:Yb,Er nanoparticles

Ivana Dinić[1], Tijana Stamenković[2], Nadežda Radmilović[2], Marina Vuković[3], Mihailo D. Rabasović[4], Vesna Lojpur[2], Lidija Mančić[1]

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Up-conversion properties of $SrGd_2O_4$ nanoparticles co-doped with different Yb^{3+} and constant Er^{3+} 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 Yb^{3+} content, which is followed by a significant change in the green to red ratio. Two-photon UC processes are established as a result of Er^{3+} f-f electronic transitions: green emission at 523 and 551 nm ($^2H_{11/2}$, $^4S_{3/2} \rightarrow {}^4I_{15/2}$) as well as a red emission at 661 nm ($^4F_{9/2} \rightarrow {}^4I_{15/2}$). The highest value of absolute quantum efficiency (0.055%) is determined for $SrGd_2O_4$ nanoparticles doped with 0.5 at% of Er^{3+} and co-doped with 5 at% of Yb^{3+} (λ_{exc}=976 nm, power density 200W/cm^2).

ORL9

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

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