

**Serbian Ceramic Society Conference
ADVANCED CERAMICS AND APPLICATION**

Organized by
Serbian Ceramic Society
&
Institute of Technical Sciences of SASA

PROGRAM AND THE BOOK OF ABSTRACTS

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P06

Pore Geometry of Ceramic Device: the Key Factor of Drug Release Kinetics

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Release kinetics of tigecycline, a potential antibiotic in treatment of osteomyelitis, from calcium hydroxyapatite (CHA), as one of the most important ceramic materials in bone tissue engineering, was investigated in this study. Tigecycline, in solid state, was mixed with CHA powder and the obtained mixture was compressed into tablets. The release of tigecycline from these tablets in a pH 7.4 phosphate-buffered saline solution was measured by a UV-VIS spectrophotometer. The release time varied from 5 to 30 days, depending on the applied pressure during tablet compression and drug concentration. A new drug release mechanism that determines the relationship between pore sizes and drug release rate is suggested here. It explains and quantifies the drug release kinetics based on pore sizes and pore size distribution.

P07

Up-conversion Luminescence in Ho^{3+} and Tm^{3+} co-doped $\text{Y}_2\text{O}_3:\text{Yb}^{3+}$ Fine Powders

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Fine yttrium oxide powders doped with Yb^{3+} and co-doped either with Tm^{3+} or Ho^{3+} were synthesized *via* spray pyrolysis at 900 °C using 0.1 M nitrate precursor. Synthesized powders were additionally thermally treated at 1100 °C for 24h. The characterization was done through X-ray powder diffraction (XRPD), scanning electron microscopy (SEM) and photoluminescent measurements (PL). Generation of cubic bixbyte-structure with space group $Ia-3$ is confirmed in all samples. Spherical particles with the mean size of ~ 380 nm generated through volume precipitation and collision of much smaller nano grains expose certain degree of porosity which increase further with the powder calcination. Powder's optical characterization includes infrared, visible and ultraviolet spectra measurements as well as determination of the lifetime. The amplified emission intensities and enhanced lifetime in thermally treated samples are correlated with the powders morphological and structural changes.