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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Magnesium substituted hydroxyapatite for biomedical application

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As magnesium is an important trace element in bone and teeth, and plays a key role in bone metabolism, the aim of this study was to obtain magnesium substituted hydroxyapatite (Mg-HAP) and to assess its application potential.
Upon synthesis, the changes in local structure and composition after irradiation and immersion in physiological solution and simulated fluid were followed by electron paramagnetic resonance (EPR) spectroscopy. Samples were also characterized by XRD, FTIR, SEM, EDS, AAS and TGA.
The results showed that irradiation did not affect the composition and structure of Mg-HAP. After immersion in model media, the small amount of by-product of synthesis disappeared already after 24 h and Mg-HAP remained as the only phase. Also, the radical signals in EPR spectra faded or completely disappeared after 28 days in model media, which could indicate that the structure and composition of Mg-HAP both went through a kind of stabilization in conditions mimicking physiological ones. All these indicate that investigated Mg-HAP has good potential for biomedical application considering its behaviour in model media which imitate physiological conditions.

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ZnO-based composite materials with improved photo(electro) catalytic properties

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Conversion of solar energy into hydrogen energy via the water-splitting process, assisted by photo-semiconductor catalysts, is one of the most promising technologies for the future because large quantities of hydrogen can be generated in a clean and sustainable manner. Zinc oxide (ZnO) represents one of the most investigated photocatalyst. Its ability to overcome the limitations of pristine ZnO through enhanced visible light absorption and reduced recombination of photogenerated charge carriers have gathered the attention of the many research groups. Numerous studies enabled understanding its greater activities and most studies reveal that reactive oxygen species (ROS), oxygen vacancies (O_v) and zinc interstitials (Zn_i) are responsible for the enhanced photoactivity. In fact, different factors like defect