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„International Conference of Experimental and Numerical Investigations and New Technologies“

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Programme

and

The Book of Abstracts

29 June – 02 July 2021

Zlatibor, Serbia

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PHASE MORPHOLOGICAL AND ANTIMICROBIAL PROPERTIES OF HAP-TIO_2 NANOMATERIALS OBTAINED BY DIFFERENT SYNTHESIS ROUTE

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Abstract

Due to the growing number of people infected with the new corona virus in the world, there is an increase in bacterial infections, which weakens the immunity. New knowledge about simple and low cost synthesis methods of materials with good structural and antimicrobial properties are of great importance nowadays. Combination of bio ceramic Hydroxyapatite material with good biocompatible characteristics and Titanium dioxide material with good degradation properties of organic molecules when combine together has ability to absorb and decompose the bacteria. Hydroxyapatite/titanium dioxide nanomaterials have been prepared by tree different synthesis route. The morphology and semi quantitative chemical analysis were characterized by scanning electron microscopy with energy dispersive X-ray analysis (SEM-EDX). Phase and structural characterization of obtained materials were determined using X-ray powder diffraction method (XRD). The crystallite sizes of the obtained materials were evaluated in the average range from 8 nm to 15 nm. Due to phase analysis by XRD characterization the peak shows presence of anatase phase with hydroxyapatite. Based on XRD peaks positions the hexagonal hydroxyapatite phases are formed in every synthesis route with TiO_2 anatase phase. The microstructural studies confirmed that the nanosized HAp coated in a different way with TiO_2 depending on a synthesis route. EDX analysis confirmed presence of Ti, Ca, P, O in obtained materials. The IR spectroscopy confirmed vibrational bands characteristic for HAp and titanium with anatase phase. The investigated materials show satisfactory antimicrobial properties.

Keywords

Hydroxyapatite, TiO_2, nanomaterials, antimicrobial properties

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