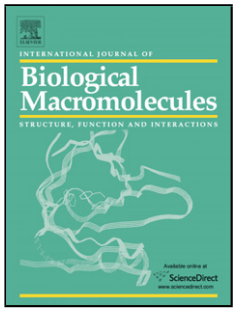

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PII: S0141-8130(16)32277-2
DOI: http://dx.doi.org/doi:10.1016/j.ijbiomac.2017.03.196
Reference: BIOMAC 7374

To appear in: *International Journal of Biological Macromolecules*

Received date: 3-11-2016
Revised date: 23-3-2017
Accepted date: 30-3-2017

Please cite this article as: Alina Sionkowska, Beata Kaczmarek, Preparation and characterization of composites based on the blends of collagen, chitosan and hyaluronic acid with nano-hydroxyapatite, International Journal of Biological Macromoleculeshttp://dx.doi.org/10.1016/j.ijbiomac.2017.03.196

Preparation and characterization of composites based on the blends of collagen, chitosan and hyaluronic acid with nano-hydroxyapatite

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Abstract

3D porous composites based on the blend of chitosan, collagen and hyaluronic acid with the addition of nano-hydroxyapatite were prepared. SEM images for the composites were made and the structure was assessed. Mechanical properties were studied using a Zwick&Roell Testing Mashine. In addition, the porosity and density of composites were measured. The concentration of calcium ions released from the material was detected by the complexometric titration method.

The results showed that in 3D porous sponge based on the blend of chitosan, collagen and hyaluronic acid, inorganic particles of nanohydroxyapatite can be incorporated, as well as that the properties of 3D composites depend on the material composition. Mechanical parameters and thermal stability of ternary biopolymeric blends were improved by the addition of hydroxyapatite. Moreover, the porosity of ternary materials was higher than in materials based on pure chitosan or collagen. All composites were characterized by a porous structure with interconnected pores. Calcium ions can be released from the composite during its degradation in water.

Keywords: hydroxyapatite; ; ; ; , collagen, chitosan, hyaluronic acid, bone regeneration

1. Introduction