**Characteristic of structure and corrosion resistance of chitosan based coatings deposited on MgZnCa alloy**

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In recent years magnesium and its alloys, became one of the most promising biodegradable materials used as bone implants. It was investigated that pure magnesium has Young modulus and density close to that of humans bones. There were performed in vitro and in vivo studies, according to those studies it was proved biodegradability of magnesium and its alloys. On the same time, it was investigated that those type of materials are non-toxic and no allergic. Nevertheless, it is still challenging to create magnesium based bone implants, because of its high corrosion rate of magnesium alloys in the solutions containing Cl- ions.

In this work, was studied corrosion behaviour of magnesium alloy (Mg19Zn1Ca) protected by natural biopolymer chitosan based coatings. The coatings were applied by using of spin coater. The following types of coatings were deposited on Mg19Zn1Ca substrate: chitosan, chitosan with addition TiO2 nanoparticles and chitosan with addition of NaF. Chitosan was chosen as natural biopolymer, which is biodegradable and safe for humans health also it is known that chitosan have antibacterial properties, and that is one of the most attractive properties of this polymer. The morphology, the structure and the chemical composition of chitosan coatings have been studied by means of FE-SEM/EDS, FT-IR, XPS and optical profilometry. It has been revealed that the roughness Ra of the chitosan/TiO2 and chitosan/NaF coatings was 1.3 µm, 2.7 µm, respectively. The corrosion tests were performed in the Hank’s solution at constant temperature (37°C) and pH (7.2). In order to determine the corrosion behaviour of tested samples, linear sweep voltamperometry (LSV) and electrochemical impedance spectroscopy (EIS) were performed. The chemical composition of chitosan coatings before and after corrosion tests have been studied by means of SEM and XPS measurements. These results obtained from the corrosion tests have shown that the chitosan coatings were dissolved in the Hank's solution after 7 days of immersion in it. During the immersion of Mg alloy in the Hank's solution, the chitosan coatings underwent dissolution and the corrosion products were deposited on its surface. The electrochemical measurements have revealed that the magnesium alloy covered by chitosan/NaF coating had a good corrosion resistance in the Hank's solution.

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