**Characterization of composite chitosan - based coatings deposited on magnesium substrate used for orthopaedic implants**

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Magnesium and its alloys have been in the focus of investigation as a material for temporary implants because of several material properties. First of all, magnesium is known to be biodegradable, biocompatible and non-toxic. In addition, the density of magnesium is close to that of human bone. One of the main obstacle for application of Mg alloys is their low corrosion resistance, especially in the environment containing the high concentration of chloride ions.

In this work, the corrosion resistance of composite chitosan – based coatings deposited on Mg20Zn substrate was investigated. The following types of coatings were deposited on Mg20Zn alloy: chitosan, chitosan containing silica glass and Na2SiO3. The chitosan coatings were deposited on the substrate by means of spin coater. The surface morphology and composition of the composite chitosan coatings were characterized by Fourier transformed infrared spectroscopy (FTIR), X-ray diffraction (XRD), X-ray photoelectron spectroscopy (XPS) and scanning electron microscopy (SEM) with energy-dispersive spectroscopy (EDS). The corrosion tests has been performed in the Hank’s solution at 37 °C. The electrochemical performance of coated magnesium alloy was evaluated by linear sweep voltamperometry (LSV) and electrochemical impedance spectroscopy. The corrosion tests have revealed that the chitosan coatings improve the corrosion resistance of magnesium alloys in the Hank’s solution. The highest corrosion resistance of Mg alloy was found when chitosan coatings were modified by addition of silicon glass and Na2SiO3.

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