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RSE-SEE

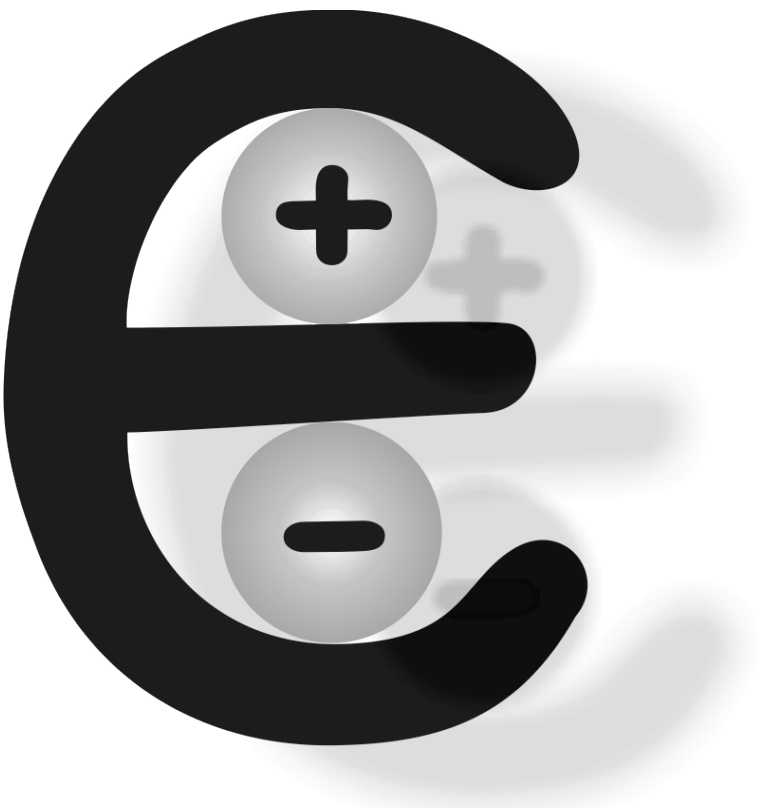
South-East Europe

Second Regional Symposium on Electrochemistry

South-East Europe

Program &

Book of Abstracts



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BEH-P-03

Resistance enhancement to the biodegradation of biocompatible magnesium alloys

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Magnesium and its alloys have some advantageous properties which make them an excellent choice for a number of applications. As the potential biodegradable materials, they show many advantages over current metallic materials and biodegradable plastics and ceramics. Biodegradable magnesium based implants in the human body can be gradually dissolved, absorbed, consumed or excreted, so there is no need for the secondary surgery to remove implants after the surgery regions have healed. Because of the high corrosion rates in physiological environment, protection coatings must be applied to the magnesium based alloys surface to prevent their prematurely degradation.
In this study, the protection efficiency of the self-assemble monolayer of fatty acids (palmitic and stearic) formed on the anodized alloy samples were investigated in a simulated physiological solution (Hank's solution) using voltammetry and electrochemical impedance spectroscopy methods.

BEH-P-04

Cyclic voltammetry study of electrochemically synthesized Ag/PVP nanocomposite

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Hydrogel nanocomposites of silver nanoparticles (AgNPs) and crosslinked poly(*N*-vinyl-2-pyrrolidone) (PVP) were synthesized *in situ* by a novel electrochemical method. PVP hydrogels, crosslinked by γ-irradiation, were swollen in the solution containing 0.1 M KNO_3 and 3.9 mM $AgNO_3$. PVP polymer matrix nanocavities were used as nanoreactors for AgNPs synthesis. The reduction of silver cations was performed using two-Pt-electrode electrochemical cell. The polarity of the electrodes was changed on the half of the implementation time, enabling the Ag^+ ions reduction in the bulk. Cyclic voltammetry (CV) was performed in a three-electrode electrochemical cell, using the saturated calomel electrode (SCE) as a reference. Ag/PVP nanocomposites were scanned by CV immediately after the synthesis and after drying followed by reswelling in 0.1 M KNO_3. Ag/PVP was compared with CVs of the following systems: Pt electrode in 0.1 M KNO_3; Pt/PVP system in 0.1 M KNO_3; Ag/Pt system in 0.1 M KNO_3 + 3.9 mM $AgNO_3$ solution.