

ELABORATION AND CHARACTERIZATION OF A COMPLEX COATING ON Ti WITH TiO₂ NANOTUBES, FUNCTIONALIZED SINGLE CARBON NANOTUBES, HYDROXYAPATITE AND IRON

Luiza ICHIM¹, Cristina DUMITRIU², Alina SURUGIU³,
Georgeta TOTEA⁴, Ioana DEMETRESCU^{5*}

Abstract. *The aim of this work is elaboration and characterization of a complex coating on Ti with TiO₂ nanotubes, functionalized single carbon nanotubes, hydroxyapatite (HA) and iron (Fe). The single carbon nanotubes (SWCNTs) were functionalized with carboxyl groups (SWCNT-COOH) and TiO₂ nanotubes were elaborated by anodization. The complex hybrid material with iron immobilized was obtained by chronopotentiometric method. The electrodeposited HA/ SWCNT-COOH/Fe coatings were investigated for two different concentration of Fe as 0.01 and 0.025 M respectively. The coating structures were studied by X-Ray Diffraction. Surface analysis was completed with contact angles determination in order to establish the hydrophilic/hydrophobic balance. Electrochemical determinations were followed by potentiodynamic measurements conducted in Hank solution and by electrochemical impedance spectroscopy investigations(EIS). As biological hemolysis experimentes were performed, and no sign of evident toxic efect was observed.*

Keywords: TiO₂ nanotubes, SWCNTs, hydroxyapatite, electrochemical tests, hemolysis.

* corresponding author

¹PhD student, University Politehnica of Bucharest, Faculty of Applied Chemistry and Materials Science, Department of General Chemistry, 1-7 Polizu Street, sector 1, Bucharest, 011061 (e-mail: necula_luiza@yahoo.com).

²PhD, University Politehnica of Bucharest, Faculty of Applied Chemistry and Materials Science, Department of General Chemistry, 1-7 Polizu, Sector 1, Bucharest, 011061 (e-mail: dumitriu.cristina.o@gmail.com).

³ Dr. Md., Clinic CF2 Hospital, 63 Marasti, Sector 1, Bucharest, Romania (email: surugiualina@yahoo.com)

⁴PhD, Buftea M. Burghel Hospital, Studioului 5, Buftea, Romania (email:)

⁵Prof., PhD., University Politehnica of Bucharest, Faculty of Applied Chemistry and Materials Science, Department of General Chemistry, 1-7 Polizu, Sector 1, Bucharest, 011061 (e-mail: ioana_demetrescu@yahoo.com)