



“Gheorghe Asachi” Technical University of Iasi, Romania



ELECTROCHEMICAL AND SEM CHARACTERIZATION OF YsZ COATED CoCrMo ALLOY PROCESSED BY PLASMA SPRAYED TECHNIQUE

**Manuela Romaş¹, Daniel Mareci¹, Daniel Sutiman^{1*},
Lucia Carmen Trincă², Sorin Iacob Strugariu³, Corneliu Munteanu³**

¹*“Gheorghe Asachi” Technical University of Iasi, Faculty of Chemical Engineering and Environmental Protection,
73 Prof. dr. doc. D. Mangeron Street, 700050, Iasi, Romania*

²*“Ion Ionescu de la Brad” University of Agricultural Science and Veterinary Medicine, Faculty of Horticulture,
3 Mihail Sadoveanu Alley, Iaşi, 700490, Iasi, Romania*

³*“Gheorghe Asachi” Technical University of Iasi, Faculty of Mechanical Engineering,
61-63 Prof. dr. doc. D. Mangeron Street, 700050, Iasi, Romania*

Abstract

The CoCrMo alloys have been widely used in artificial knee or hip joints. It is well known that these materials have a good corrosion resistance and acceptable biocompatibility properties. Zirconia as a ceramic biomaterial facilitates the osteoconductivity and tissue osteogenetic capacity in new bone formation around implant. Linear polarization and electrochemical impedance spectroscopy (EIS) were employed to characterize the electrochemical behavior of plasma sprayed yttrium oxide stabilized zirconium oxide (YsZ) coated CoCrMo alloy in Ringer solution. Surface characterization before and after electrochemical testing was performed used scanning electron microscopy (SEM). YsZ-coated showed higher zero corrosion potential (ZCP) and lower corrosion current density (i_{corr}) compared with the CoCrMo substrate. The electrochemical properties of the coated CoCrMo sample at the open circuit potential at different immersion time in Ringer solution were studied by EIS. Equivalent circuit (EC) was used to modeling EIS data, in order to characterize YsZ-coated CoCrMo surface.

Key words: EIS, plasma spraying, polarization, SEM, XRD, YsZ-coating

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* Author to whom all correspondence should be addressed: e-mail: sutiman@tuiasi.ro; Phone: +40232278683; Fax: +40232271311