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IN VITRO ELECTROCHEMICAL PROPERTIES OF BIODEGRADABLE YSZ-COATED MgCa ALLOY

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Abstract

Zirconia (ZrO_2) as a ceramic biomaterial facilitates the osteoconductivity in new bone formation around implant. Surface characterization before and after electrochemical testing was performed used scanning electron microscopy (SEM). The electrochemical properties of the yttrium oxide stabilized zirconium oxide (YSZ) coated and uncoated MgCa sample with the open circuit potential at different immersion time in Ringer's solution were studied by electrochemical impedance spectroscopy (EIS). Equivalent circuits (ECs) were used to modeling EIS data, in order to characterize YSZ-coated and uncoated MgCa surface. The polarization resistance of the YSZ coated and uncoated MgCa decreases with the immersion time. However, after 2-days immersion in Ringer's solution the corrosion resistance presenteded bigger value for the uncoated (360 Ω cm^2) than YSZ coated (140 Ω cm^2) MgCa alloy. The present study, showed that electrochemical determinations can be a usefull tool to characterize such alloys. Knowledge of *in vitro* corrosion behaviour of these alloys may lead to a better undersanding of any biologically adverse effects *in vivo*.

Key words: EIS, MgCa alloy, plasma spraying, SEM, YSZ-coated

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