Optimized In-vitro Corrosion Assessment of a FeAl intermetallic Compound Modified with Ag in Artificial Human Media

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This article presents an assessment about the effect of the addition of silver on the corrosion performance of the intermetallic alloy Fe40Al (at. %) in a biomimetic environment that simulates the biological human body fluid. In the present work, an in-vitro corrosion assessment of Fe40Al based alloys was performed, since the electrochemical parameters of Fe40Al and Fe40Al2.5Ag alloys were compared. According to the polarization curves, the corrosion current density of Fe40Al2.5Ag alloy resulted minor than that of binary Fe40Al alloy; however, according to the measurements of the linear polarization resistance, the current density of the ternary alloy resulted higher than that of the binary FeAl based alloy. This behavior is ascribed to the enhancement of the protective character of the Al-oxide layer of the Fe40Al aluminide, while the exposed time in the Hanks' solution had elapsed.

Keywords: Corrosion, Fe-Al alloy, Hanks' solution, biomaterial, noise, polarization curve.

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