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Effect of graphene on corrosion behavior of hydroxyapatite coating on magnesium AZ31

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Abstract

Magnesium alloy is used as biomaterial due to its unique properties, but the high corrosion rate of Mg in biomedical Mg alloys is concerned. In this present work, nanostructured hydroxyapatite (n-HAp) and hydroxyapatite/grapheme (HA/G) composite coatings via electrophoretic deposition (EPD) method applied on magnesium surface. The electrochemical corrosion behavior of magnesium alloy, hydroxyapatite and HA/graphene coated Mg are studied in simulated body fluid (SBF). The electrochemical corrosion behavior of the Mg and HA/G coated Mg in the simulated body fluid at 37^{o} C are also investigated using Electrochemical Impedance Spectroscopy (EIS) analysis. The tafel plot tests were carried out to evaluate the corrosion behavior of the coated and uncoated specimens. Results revealed that the HA/G coated AZ31 Mg alloy samples with lower corrosion current density leads to a lower Mg degradation rate.

Keywords: Hydroxyapatite, Graphene, Magnesium, Electrophoretic

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