

Electrochemical Behavior of Micro-arc Oxidation Coated Magnesium Alloy in Cell Culture Medium

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The electrochemical behaviors of MAO (micro-arc oxidation) coated AZ31 magnesium alloys immersed in cell culture medium are reported. Four different MAO processing times (1 minute, 5 minutes, 15 minutes and 20 minutes) were used to produce the MAO coatings on AZ31 magnesium alloy sample surface. After cell culture medium immersion tests, all samples demonstrate similar electrochemical behaviors regardless of MAO processing time, which is in contrast with immersion in simulated body fluids. The corrosion rates in cell culture medium are much lower than in simulated body fluid. This can be explained by the organic molecules in the cell culture medium and a dense passive layer formed on the samples surface, which prevent aggressive ions, such as chloride ions, from corroding the alloy substrate.