Corrosion and microstructure investigation of plasma electrolytic oxidation coating on AZ91D magnesium alloy

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A ceramic coating was prepared on the surface of AZ91D alloy by means of plasma electrolytic oxidation (PEO) technique. Scanning electron microscope (SEM) was employed to characterize the surface morphology and cross-section microstructure of the coating. The phase composition of the PEO coating was analyzed by X-ray diffraction (XRD). The corrosion resistance of the coating was evaluated by potentiodynamic polarization and electrochemical impedance spectroscopy (EIS) methods in a 3.5% NaCl solution. Polarization data showed that the PEO treatment can significantly decrease the corrosion current compared to the AZ91D alloy without any coating. EIS plot of coating sample had two capacitive loops which these capacitive arcs present a barrier and a porous layer of the PEO film.

Keywords
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