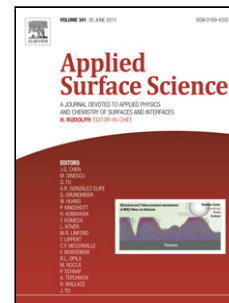


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Evolution processes of the corrosion behavior and structural characteristics of plasma electrolytic oxidation coatings on AZ31 magnesium alloy

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Highlights

- In order to avoid the influence of other ions, a simple electrolyte is used to research function of SiO_3^{2-} .
 - The corrosion protectiveness of the PEO coating of AZ31 Mg alloy is decreased with the PEO time.
 - The compact structure and the stable phase composition of the coatings are the key factors for their excellent corrosion protectiveness.
 - The corrosion protectiveness of PEO coatings on AZ31 Mg alloy, treated in the simple silicate electrolyte, decreases with the PEO time.
 - A compact thin inner layer and discharge channels can be observed on the fractured cross-sections of the detached coatings.
 - Compared to polished cross-section morphology, fractured one is more actual and coincident with the electrochemical analysis results.
 - XRD analysis of Mg alloy-based detached PEO coatings is performed for the first time.
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