Short Communication

Study on the Characteristics of MAO/Polymer/Ni Three-Layer Composite Film formed on AZ31 Magnesium Alloy

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In this study, MAO/Polymer/Ni three-layer composite coating deposited on AZ 31 magnesium alloy was carried out by micro-arc oxidation, spinning coated and eletroless Ni processes. The characteristics of different coatings were analyzed by XRD, SEM, TEM and EDS. The MAO film subsequent sealing with polymer layer, the polymer agent will fill up the micro-arc holes of MAO film. Finally, an electroless nickel layer were deposited on polymer film to form a MAO/polymer/Ni composite coating. It can significantly decrease the i_{corr} value from $39.6 \times 10^{-6} \text{ A/cm}^2$ to $7.2 \times 10^{-6} \text{ A/cm}^2$. The MAO/polymer/Ni coating significantly enhanced the corrosion resistance of the AZ31 alloy due to the protection performance both of polymer and nickel layer.

Keywords: AZ31 magnesium alloy, micro-arc oxidation, polymer layer, electroless nickel

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