Corrosion Behavior of Electroless Ni-P/Ni-B Coating on Magnesium Alloy AZ91D in NaCl Environment

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The Ni-P/Ni-B coating was deposited on AZ91D magnesium alloy by electroless plating. Ni-P coating as inner layer and Ni-B coating as outer layer. A tight and compact Ni-P/Ni-B coating on Mg alloy substrate was formed via Ni-P plating for 70 min and Ni-B plating for 20 min. The corrosion behavior of coating was studied by electrochemical test and neutral salt spray test in the presence of chloride environment. The test results shown that the double coating has better corrosion resistance than single Ni-P or Ni-B coating. Ni-B plated outer layer functions as cathodic protective and sealing layer, assisting Ni-P coatings in obstructing the attack of Cl⁻ in the stage of long-term immersion in NaCl solution.

Keywords: Electroless Ni-P; Electroless Ni-B; Corrosion; Mg alloy; EIS

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