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Alumina- Zirconia coatings produced by Plasma Electrolytic Oxidation on Al alloy for corrosion resistance improvement

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Abstract

Compact alumina-zirconia nano composites with corrosion protection potential were coated on 7075 Al alloy through the Plasma Electrolytic Oxidation (PEO) method in DC galvanostatic mode. The layers were coated at constant current density of 20 A/dm^2 and 100-350 s growth time in an alkaline K_2ZrF_6 containing electrolyte. The characteristics of the coatings were investigated as a function of PEO processing time. Electrochemical properties of the layers were studied by conducting potentiodynamic polarization experiments in 3.5% NaCl solution. The results showed that under the present PEO experimental conditions, alumina-zirconia nanostructured coatings can be produced with 10-30 μm thickness and 0.4-2.35 μm roughness depending on the processing time. Phase

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