

Influence of heat treatment condition on passivity of titaniumaluminum-vanadium alloy in sodium chloride solution

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Abstract: Corrosion of Ti6Al4V was study with different heat treatments in 3,5% NaCl solution by electrochemical measurements, included potentiodynamic polarization curves, linear polarization resistance (LPR) measurements and electrochemical impedance spectroscopy (EIS), in order to focus on exploring the effect of annealing on the electrochemical response in a quantitative manner. The samples were prepared in the state of the art; heat treatments were applied at four different temperatures of 550, 750, 950 and 1100°C. The microstructure of samples has been studied using the optical microscopy and the mechanical properties have been evaluated such as microhardness HV. The electrochemical test show that the corrosion rates of treated samples at temperature equal or more than 750 ° C; are much better for the untreated sample. Although, the corrosion product on the surface is identified as titanium dioxide by XRD in all samples.

Keywords : Ti6Al4V, corrosion, heat treatment, Corrosion product, XRD