Corrosion Behavior of Nitrided Ni₃Al Intermetallic Alloy in 0.5 M H₂SO₄

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The effect of plasma nitriding on the corrosion behavior of Ni₃Al intermetallic alloy in 0.5 M H₂SO₄ solution at 60 °C has been investigated by using potentiodynamic polarization curves, electrochemical impedance spectroscopy (EIS) and linear polarization resistance (LPR) measurements. Specimens were plasma nitrided at 500 and 600°C during 8, 16 and 24 hours and were characterized by x-ray diffraction and scanning electronic microscopy. Results have shown that the thickness of nitride layer increased with nitriding time and temperature. Passive film properties were improved by nitriding. The corrosion resistance of nitride specimens increased with an increase either in the nitriding time or temperature. Specimens were susceptible to both uniform and localized types of corrosion.

Keywords: Ni₃Al, nitriding, acid corrosion.

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