

عنوان مقاله:

An investigation on the passivation behavior of nitrogen enriched AISI ۳۱۶L austenitic stainless steel

محل انتشار:

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خلاصه مقاله:

In the present work the effects of plasma nitridization on the passivation behavior of AISI ۳۱۶L was investigated. To do this; nitriding treatments were carried out at ۴۲۰°C for ۱, ۲, ۴ and ۱۶ hours. The phase composition and structure of the nitrided layer were studied by Low Angle X-ray diffraction and Scanning Electron Microscopy. The hardness of samples also was evaluated by Vickers microhardness test method. Potentiodynamic Polarization Scan (PDS) and Electrochemical Impedance Spectroscopy (EIS) techniques were used for corrosion studies. The plasma nitridization process produced surface-modified layers essentially composed of a metastable phase called S-phase, for all the nitrided samples, independent of the nitriding time. Surface microhardness measurements revealed that the surface hardness of treated samples was higher compared to that in untreated samples and that it increased with the treatment time. Electrochemical tests demonstrated that plasma nitriding for ۴ h is the optimum treatment condition regarding corrosion behavior of nitrided austenitic stainless steels. In addition, nitriding treatment increases passivation current values and decreases charge transfer resistance value of the passive film.

کلمات کلیدی:

AISI ۳۱۶L, Plasma Nitriding, Passivation, Low Angle XRD, Potentiodynamic Scan, Impedance spectroscopy

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