

Effect of *in situ* Ion Nitride Treatment on the Corrosion Behavior of Titanium

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Ion nitriding was applied to titanium grade II (TA2) to observe the impact it had on corrosion behavior of Titanium structures. X-ray diffraction, potentiodynamic polarization, electrochemical impedance spectroscopy and Mott-Schottky were used to study the microstructure, electrochemical corrosion properties and semiconducting behaviors of Titanium samples. Cubic TiN and tetragonal Ti₂N were formed using ion nitriding treatment. Compared with TA2, ion nitrided TA2 had better resistance to corrosion. The Mott-Schottky curves indicated that the surface layers of TA2 and ion nitride TA2 were not sensitive to the frequency response. TA2 showed n-type and p-type semiconducting behaviors over the potential range measured. However, ion nitride TA2 showed only n-type semiconducting behavior.

Keywords: Ion nitriding; TA2; Corrosion resistance; Semiconducting behavior

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