
Corrosion behavior of inconel 718 superalloy treated by plasma based ion implantation

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Abstract

A superalloy is an alloy developed for elevated temperature service, where relatively severe mechanical stressing is encountered, and where high surface stability is frequently required. High temperature deformation of Ni-base superalloys is very important since the blades and discs of aeroengine turbine, because need to work at elevated temperature for an expected long period. The objective of this work is to investigate the improvement of a superalloy Inconel 718 double aging treatment and surface properties through treatments by Plasma Based Ion Implantation (PBII) for 3 hours. The experiment was carried out at INPE plasma immersion ion implantation reactor. Corrosion properties were determined with polarization technique in 3.5% NaCl solution at room temperature. The results from AES showed that a maximum implantation depth of ~ 370 nm with about 15% N content was achieved for the sample treated with N₂ for 3 h. There was a small increase in corrosion resistance after implantation of nitrogen on the surface Inconel 718.

Keywords: Plasma, corrosion, Inconel 718

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