

عنوان مقاله:

Investigation on the Effects of Magnetic Field on Bromide-Induced Pitting of Commercially Pure Titanium

محل انتشار:

دهمین کنگره ملی خوردگی ایران (سال: 1386)

تعداد صفحات اصل مقاله: 10

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خلاصه مقاله:

In chloride salt solutions, titanium alloys exhibit reasonably high pitting potentials as high as +10 V (vs. Ag/AgCl) at room temperatures. On the other hand, anodic pitting potentials are significantly lower in bromide solutions. In this study, pitting corrosion of commercially pure titanium in aqueous NaBr solution of 0.1 M concentration at room temperature was studied and the effect of an external magnetic field oriented both parallel and perpendicular to electrode surface was investigated. Cyclic potentiodynamic and potentiostatic polarization tests were carried out. Anodic breakdown potential of +1.4 V (vs. Ag/AgCl) obtained in the absence of magnetic field, decreasing to +1.1 V in the presence of a 0.05 T parallel magnetic field. The perpendicular magnetic field actually did not affect the breakdown potential. Applying of an external magnetic field, independent of its orientation, shifted the repassivation potential 100 mV in the positive direction. SEM microscopy observations of sample surfaces indicated that applying of magnetic field results in some variations in the pit shapes and their sizes.

کلمات کلیدی:

Titanium, Bromide, Pitting, Magnetic Field, Polarization

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