

عنوان مقاله:

HIC and SCC Corrosion Behavior of the 1Y-4 PH Stainless Steel in Double Over Aged Condition

محل انتشار:

مجله علوم و مهندسی خوردگی، دوره 11، شماره 39 (سال: 1399)

تعداد صفحات اصل مقاله: 12

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خلاصه مقاله:

This research studied the effect of two-stage over aging treatment on the 1Y-4 PH stainless steel corrosion behavior. First, the steel was solution annealed at 1035 °C for 1h, then it was subjected to a two-stage over aging treatment known as H1150-M treatment. Hydrogen induced cracking and stress corrosion cracking standard tests were carried out under annealed and over aged conditions. Microhardness tests were conducted to evaluate the mechanical properties under different testing conditions. Microstructural examinations were performed by the optical microscope and field emission scanning electron microscope. The results showed that under annealed condition, the microstructure consisted of lath and coarse martensite and interdendritic δ -ferrite that transferred to severely tempered and layered martensite after over aging treatment with the formation of reversed austenite. In the latter case, the reversed austenite was about 26% compared to 7% before over aging treatment. Under the hydrogen induced cracking test, the over aged 1Y-4 PH steel exhibited no cracking, unlike the annealed condition. The results also showed that 1Y-4 PH steel under both annealing and over aging conditions, is susceptible to stress corrosion cracking; meanwhile, time to failure was substantially higher in the latter condition.

کلمات کلیدی:

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