

Pitting corrosion resistance of the 316L stainless steel welds: influenced of oxygen content in the protective gas

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ABSTRACT

This Pitting corrosion is one of the most important degradation modes in welded stainless steels. In the present study, the influence of oxygen content, as impurity in the protective gas, on pitting corrosion resistance of an AISI 316L stainless steel pipeline after arc welding is studied. The samples were welded by Gas Tungsten Arc Welding (GTAW) with the presence of oxygen content between 1000 ppm to 25000 ppm. Scanning Electron Microscopy (SEM) was used to investigate the microstructure, which contained inclusions and pits. Corrosion tests was carried out in salty environment according to ASTM G5-13 standard. Corrosion characteristic curves were obtained using the electrochemical potentio kinetic reactivation method by potentio dynamic measurements. The study revealed that, pitting corrosion resistance decreases with increase in oxygen content. Besides, the CaS inclusions were identified as potential initiation site of the pits after arc welding.