Short Communication

Corrosion Behavior of High-Nitrogen Stainless Steel in NaCl Solution

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doi: 10.20964/2017.12.80

Received: 12 August 2017 / Accepted: 18 October 2017 / Published: 12 November 2017

A new high nitrogen nickel free stainless steel (HNSS) was proposed in this paper, which is responsible for the solving the problem of corrosion failure of the heat exchangers. The passivity and semi-conducting behavior of HNSS in 0.5 mol/L NaCl solution have been investigated. The polarization curve of HNSS showed that the material exhibit self-passivation. Mott-Schottky plots indicate that the stability of the passive film decrease with the increase of applied potential. The primary constituents of the passive films formed are iron oxides, manganese oxides and iron oxides. Chloride ions are not incorporated in the oxide layer, but N enrichment appeared in the passive film. The presence of $\text{NH}_3/\text{NH}_4^+$ could accounts for the enhanced protection of the passive film.

Keywords: A. Corrosion , B. High nitrogen stainless steel , C. Passive film , D. XPS analysis

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