

Accepted Manuscript

Title: Silicon Effects on the Wet Oxidation of Type 310
Stainless Steel

Authors: Shooka Mahboubi, Hatem S. Zurob, Gianluigi A.
Botton, Joseph R. Kish



PII: S0010-938X(18)30309-3
DOI: <https://doi.org/10.1016/j.corsci.2018.08.011>
Reference: CS 7647

To appear in:

Received date: 13-2-2018
Revised date: 16-7-2018
Accepted date: 6-8-2018

Please cite this article as: Mahboubi S, Zurob HS, Botton GA, Kish JR, Silicon Effects on the Wet Oxidation of Type 310 Stainless Steel, *Corrosion Science* (2018), <https://doi.org/10.1016/j.corsci.2018.08.011>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Silicon Effects on the Wet Oxidation of Type 310 Stainless Steel

Shooka Mahboubi, Hatem S. Zurob, Gianluigi A. Botton, Joseph R. Kish*

Department of Materials Science and Engineering

McMaster University

1280 Main Street West, Hamilton, ON, CA

*Corresponding Author: kishjr@mcmaster.ca | 1-905-525-9140 (extension 21492)

Department of Materials Science and Engineering, McMaster University,

1280 Main Street West, Hamilton, ON, CA

Highlights

- Si-alloying significantly alters the oxide scale formed during wet oxidation.
- Lower parabolic rate constant linked to continuous SiO₂ layer improves protection.
- Cr-rich silicides serve as reservoirs replacing oxidized Cr lost to volatilization.

Abstract

The wet oxidation performance of a high-Si (5.9 wt.%) Type 310 stainless steel exposed in flowing ambient pressure (0.1 MPa) air-10% H₂O mixture at 800 °C was investigated. A lower parabolic rate constant, relative to that exhibited by conventional

Download English Version:

<https://daneshyari.com/en/article/10227064>

Download Persian Version:

<https://daneshyari.com/article/10227064>

[Daneshyari.com](https://daneshyari.com)