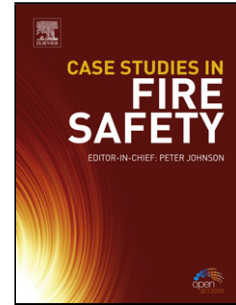


Accepted Manuscript

Title: Study of stainless steels corrosion in a strong acid mixture. Part 1: Cyclic potentiodynamic polarization curves examined by means of an analytical method

Authors: Tiziano Bellezze, Giampaolo Giuliani, Gabriella Roventi



PII: S0010-938X(17)31132-0
DOI: <https://doi.org/10.1016/j.corsci.2017.10.012>
Reference: CS 7225

To appear in:

Received date: 26-6-2017
Revised date: 13-10-2017
Accepted date: 18-10-2017

Please cite this article as: Tiziano Bellezze, Giampaolo Giuliani, Gabriella Roventi, Study of stainless steels corrosion in a strong acid mixture. Part 1: Cyclic potentiodynamic polarization curves examined by means of an analytical method, Corrosion Science <https://doi.org/10.1016/j.corsci.2017.10.012>

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.

Study of stainless steels corrosion in a strong acid mixture. Part 1: Cyclic potentiodynamic polarization curves examined by means of an analytical method

Tiziano Bellezze*, Giampaolo Giuliani, Gabriella Roventi

*Polytechnic University of Marche, Department of Materials, Environmental Sciences and Urban Planning,
Via Breccie Bianche, 60131, Ancona, Italy*

(*)Tiziano Bellezze: corresponding author, Tel. +39 071 2204413, Fax +39 071 2810327, e-mail t.bellezze@univpm.it;
Giampaolo Giuliani: Tel. +39 071 2204727, e-mail giampaolo.giuliani@univpm.it
Gabriella Roventi: Tel. +39 071 2204272, e-mail g.roventi@univpm.it;

Highlights

- An analytical method to obtain parameters from anodic curves is proposed
- A simplified anodic characteristic of the stainless steels is presented
- The role of the alloying elements and the temperature is examined and discussed
- Cr and Mo are the most effective elements in the active-passive transition
- AISI 904L, Sanicro 28 and SAF 2707 showed the best anodic characteristics

The corrosion resistance of AISI 316L, AISI 904L, Sanicro 28, SAF 2205, SAF 2507 and SAF 2707 was studied in an acid mixture containing tartaric acid saturated solution, H₂SO₄ and HCl, as a function of temperature (22-60 °C) and alloys composition. The stainless steels were examined through anodic polarization curves; an analytical method is proposed to obtain the characteristic parameters from these curves. The results indicate that Cr and Mo play the most important role on the active-passive transition of the tested alloys. AISI 904L, Sanicro 28 and SAF 2707 showed the best anodic characteristics among the examined stainless steels.

Keywords: A. acid solutions; A. stainless steel; B. polarization; C. acid corrosion; C. potential parameters; C. kinetic parameters.

1. Introduction

The corrosion resistance of some stainless steels (SSs) in acid environment was studied in order to find an alternative to AISI 316L for use in the serpentine cooling system and the stirrer blades of the crystallizers operating in an industrial plant for the production of tartaric acid, as a by-product of grape pressing. At the working temperature range 22-60 °C, this material is in contact with a strong

Download English Version:

<https://daneshyari.com/en/article/7894019>

Download Persian Version:

<https://daneshyari.com/article/7894019>

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