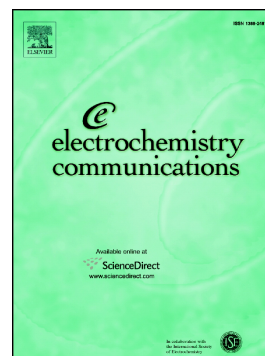


Accepted Manuscript

Application of a modified bi-polar electrochemistry approach to determine pitting corrosion characteristics

Yiqi Zhou, Dirk Lars Engelberg



PII: S1388-2481(18)30155-3
DOI: [doi:10.1016/j.elecom.2018.06.013](https://doi.org/10.1016/j.elecom.2018.06.013)
Reference: ELECOM 6239
To appear in: *Electrochemistry Communications*
Received date: 29 April 2018
Revised date: 19 June 2018
Accepted date: 27 June 2018

Please cite this article as: Yiqi Zhou, Dirk Lars Engelberg , Application of a modified bi-polar electrochemistry approach to determine pitting corrosion characteristics. *Elecom* (2018), doi:[10.1016/j.elecom.2018.06.013](https://doi.org/10.1016/j.elecom.2018.06.013)

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.

Application of a modified bi-polar electrochemistry approach to determine pitting corrosion characteristics

Yiqi Zhou^{*1}, Dirk Lars Engelberg^{1,2}

(1) Corrosion & Protection Centre, School of Materials, The University of Manchester, M13 9PL, Manchester, UK

(2) Materials Performance Centre, The University of Manchester, M13 9PL, Manchester, UK

* Corresponding author: Yiqi.Zhou@postgrad.manchester.ac.uk

Abstract

The application of bi-polar electrochemistry produces a linear potential gradient between two feeder electrodes, allowing the full spectrum of anodic to cathodic reaction kinetics to be controlled. A modified bi-polar approach is introduced, by superimposing a constant electrochemical potential on the potential gradient, thereby controlling the location and spatial distribution of anodic to cathodic reactions along the exposed sample surface. Application of this approach is demonstrated by controlling the extent of pitting corrosion in austenitic stainless steel as a function of the applied potential.

Keywords

Bi-polar electrochemistry, stainless steel, pitting corrosion, potentiostatic polarisation

Introduction

Bi-polar electrochemistry produces a linear potential gradient between two feeder electrodes. A metallic sample exposed to such a potential gradient solicits spatially separated anodic to cathodic electrochemical reactions along the sample surface [1–5]. This provides the means to obtain a continuous spectrum of electrochemical polarisation characteristics on one sample surface, as a function of distance between both feeder electrodes. Applying bi-polar electrochemistry therefore provides a wireless, non-contact setup for fast throughput corrosion screening [1, 6, 7].

Download English Version:

<https://daneshyari.com/en/article/6600702>

Download Persian Version:

<https://daneshyari.com/article/6600702>

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