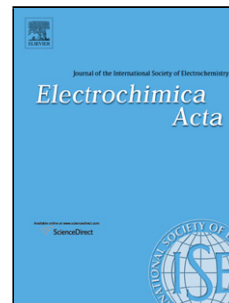


Accepted Manuscript

Title: Effect of low levels of sulphate on the current density and film morphology during anodizing of aluminium in chromic acid

Author: D. Elabar T. Hashimoto J. Qi P. Skeldon G.E. Thompson



PII: S0013-4686(16)30249-3
DOI: <http://dx.doi.org/doi:10.1016/j.electacta.2016.01.230>
Reference: EA 26699

To appear in: *Electrochimica Acta*

Received date: 16-12-2015
Revised date: 29-1-2016
Accepted date: 30-1-2016

Please cite this article as: D.Elabar, T.Hashimoto, J.Qi, P.Skeldon, G.E.Thompson, Effect of low levels of sulphate on the current density and film morphology during anodizing of aluminium in chromic acid, *Electrochimica Acta* <http://dx.doi.org/10.1016/j.electacta.2016.01.230>

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.

Effect of low levels of sulphate on the current density and film morphology during anodizing of aluminium in chromic acid

D. Elabar, T. Hashimoto, J. Qi, P. Skeldon,* G.E. Thompson

Corrosion and Protection Group, School of Materials, The University of Manchester, Manchester M13 9PL.

U.K.

*corresponding author

E-mail: p.skeldon@manchester.ac.uk

Tel: + 44 161 306 4872

Fax: + 44 161 306 4865

Highlights

- Anodic films are formed on aluminium in chromic acid with ppm levels of sulphate.
- Sulphate incorporated into films reduces the anodizing current density and cell size.
- Diffusion limited transport of sulphate leads to a duplex film morphology.
- Sequential anodizing indicates a key role for sulphate at the pore bases.
- Tracer experiments are employed to investigate the pore formation mechanism.

Abstract

Previous work has shown that a low level of sulphate impurity in chromic acid can significantly change the growth rate and the morphology of porous anodic films formed on aluminium at a constant voltage. The changes were associated with incorporation of sulphate into the films. The present study employs electron microscopy to reveal the growth of larger pores and cells at longer times of anodizing than previously used, leading to a duplex film

Download English Version:

<https://daneshyari.com/en/article/6608175>

Download Persian Version:

<https://daneshyari.com/article/6608175>

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