

Accepted Manuscript

Full Length Article

Influence of temperature and time on the fabrication of self-ordering porous alumina by anodizing in etidronic acid

M. Sepúlveda, J.G. Castaño, F. Echeverría

PII: S0169-4332(18)31381-3
DOI: <https://doi.org/10.1016/j.apsusc.2018.05.081>
Reference: APSUSC 39357

To appear in: *Applied Surface Science*

Received Date: 23 January 2018
Revised Date: 19 April 2018
Accepted Date: 11 May 2018

Please cite this article as: M. Sepúlveda, J.G. Castaño, F. Echeverría, Influence of temperature and time on the fabrication of self-ordering porous alumina by anodizing in etidronic acid, *Applied Surface Science* (2018), doi: <https://doi.org/10.1016/j.apsusc.2018.05.081>

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.



**Influence of temperature and time on the fabrication of self-ordering porous alumina
by anodizing in etidronic acid.**

M. Sepúlveda¹, J.G. Castaño^a, F. Echeverría^a.

^a **Centro de Investigación, Innovación y Desarrollo de Materiales-CIDEMAT, Universidad de
Antioquia UdeA; Calle 70 N° 52–21, Medellín, Colombia.**

lina.sepulveda@udea.edu.co

Abstract

The growth behavior of anodic porous alumina formed on aluminum by anodizing in etidronic acid was investigated. A high-purity aluminum foil was anodized in a 0.3 M etidronic acid solution at 25 °C and 40 °C and a constant anodizing voltage was 270 V. The estimated rate of oxide growth was approximately 3.9 $\mu\text{m}\cdot\text{h}^{-1}$ at 25 °C and 20 $\mu\text{m}\cdot\text{h}^{-1}$ at 40 °C and the anodizing process efficiency was about 80 % and 85 %, respectively. The influence of the electrolyte temperature and anodizing time on the self-ordering of nanopores alumina was studied with the averaged regularity ratio evaluated from Fast Fourier Transform intensity profile. The FFT and the regularity ratio showed that increasing the electrolyte temperature, the rate of self-ordering increases, greatly reducing the time required to obtain a highly ordered structure.

Keywords: *Anodizing process, Porous anodic aluminum oxide, Etidronic Acid*

1. Introduction

¹ Corresponding Author
Tel: + 574 2196617
Fax: + 574 2196565
Email: lina.sepulveda@udea.edu.co

Download English Version:

<https://daneshyari.com/en/article/7833223>

Download Persian Version:

<https://daneshyari.com/article/7833223>

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