

## Accepted Manuscript

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PII: S0009-2509(18)30239-2  
DOI: <https://doi.org/10.1016/j.ces.2018.04.033>  
Reference: CES 14165

To appear in: *Chemical Engineering Science*

Received Date: 6 August 2017  
Revised Date: 18 March 2018  
Accepted Date: 15 April 2018

Please cite this article as: E. Mena, M. López, M. José Martín de Vidales, J. Marugán, MODELLING THE ANODIZATION OF LARGE TITANIUM ELECTRODES, *Chemical Engineering Science* (2018), doi: <https://doi.org/10.1016/j.ces.2018.04.033>

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**MODELLING THE ANODIZATION OF LARGE TITANIUM ELECTRODES**

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**Abstract**

Potentiostatic anodization of large size titanium electrodes ( $>200 \text{ cm}^2$ ) has been modelled and validated. During the process, with the development and growth of the  $\text{TiO}_2$  nanotubes ( $\text{TiO}_2$ -NTs) layer there is a variation in the resistance of the system. A time-dependent model for this parameter is implemented looking for fitting the experimental data of current density with the simulation results. Finally, and more importantly, the model allows obtaining the distribution of oxidized titanium mass in the surface of the electrode. Although in this case the geometry of the anodized titanium plate is quite simple, the same procedure can be applied for the anodization of more complicated electrodes. Consequently, it is possible to evaluate whether the distribution of  $\text{TiO}_2$  structures with the electrochemical anodization procedure is adequate or not without carrying out the expensive and time-consuming experimental research stage.

**Keywords**

Electrochemical model; Large size electrodes;  $\text{TiO}_2$ -NTs; Potentiostatic anodization; Resistance variation

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